## Polar M430 Smartwatch - Use

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Revision: 17098  
Effective date: 09/28/2017

# Purpose

This protocol details the use of the Polar M430 smartwatch.

# Device features

The Polar M430 features:

* Heart rate monitor (continuous). 1s resolution. Accuracy is not outstanding using native LED-wrist-bloodflow monitoring, but dramatically improves when pairing watch with the Polar H10 chest strap.
* GPS tracker (up to 30 continuous hours with 60s epochs in power-save Training mode)
* Actigraphy-based sleep monitoring (continuous). Accurate, but not nearly as feature-rich as the Phillips Actiwatch, and currently unable to export from Flow web app.
* Step counter (continuous)
* Fitness coaching and workout-monitoring features

Data output formats include:

* All data can be visualized using the Polar Flow web app.
* Heart rate data can be exported from Polar Flow web app in .CSV format, with 1s temporal resolution.
* GPS data can be exported from Polar Flow web app in .GPX format (basically .XML), with 60s temporal resolution on power-save mode.

# Assignment of responsibilities

A principal operator should be assigned for the maintenance, setup and data- retrieval on each Polar M430.

Operator(s):  
Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Init\_\_\_\_\_\_ Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Init\_\_\_\_\_\_

# Equipment and supplies

* Polar M430 smartwatch
* Supplied charging/data-transfer cable
* Android smartphone
* [Polar Flow web app and account](https://flow.polar.com/)
* Polar Flow Android app (available on Google Play)
* [Polar FlowSync software](https://flow.polar.com/start)
* Polar H10 heart monitor strap

# Methods and procedures

## Setup

* **Initial setup:** Download the Polar Flow app to your Android smartphone. Log in using your Polar account. If you do not yet have an account, you may be prompted to create one.  
  Download the Polar FlowSync software to your desktop computer and run the installer. Connect the watch to the computer using the supplied charging/data-transfer cable. You will be prompted to set up or log in to a Polar Flow account. Follow the on-screen instructions to set up your account and register the watch to that account. The FlowSync software will then notify you when the device has been synced to the software.
* **Resetting the watch:** If the device has been used previously on another account, it will need to be reset to factory settings. This can be done by going to the "Settings" screen (accessed through the cog icon). *Caution: Factory reset will wipe all data off of the device.* After resetting the watch, click "Sync" again and wait for the sync to finish.
* **Pairing the watch with your phone:** *Please sync the watch with the Flow service using a desktop computer as described above. The device may not register properly on the phone if has not already been registered through the desktop.*  
  Open the Polar Flow app on your phone and login to your account.  
  On the phone, go to Bluetooth and make sure it is enabled. Enable "Other Bluetooth devices can find your phone". This will only last for a minute or two so proceed quickly to the next steps.  
  Go to "Devices" under the main menu. You should see "Got a new Polar device with mobile setup?".  
  On the watch, navigate (using the top and bottom right-side buttons) to "Settings", "General settings", "Pair and sync", and "Pair and sync mobile device". Place the watch so that it is touching the phone. You will see the watch saying "Pairing".  
  When you see the Polar M430 appear on the phone's screen, select it. You will be prompted to enter a passcode which will be supplied by the smartwatch screen). Do so. The watch will say "Syncing", then after a minute report that the pairing is complete.
* **Pairing the watch with heart monitor strap:** You should be wearing the H10 heart monitor before attempting to pair it with the M430 smartwatch. (Alternately, you may be able to hold your fingers against the metal contacts on the "puck" in order to fake the heart monitor into turning on long enough to pair with the watch.)  
  On the watch, navigate (using the top and bottom right-side buttons) to "Settings", "General settings", "Pair and sync", and "Pair other device". Place the watch so that it is close to the H10 puck and wait for the watch to confirm that they are now paired.
* **Setting continuous heart-rate tracking:** By default, continuous heart-rate tracking is off, meaning you must enter Training mode in order to acquire heart rate data. To turn continuous heart-rate tracking on, on the watch, navigate (using the top and bottom right-side buttons) to "Settings", "General settings". Select "Continuous HR tracking" and press Select (the middle button on the right side).  
  *Note that continous HR tracking is still not fully continuous, but activates only when the heart rate is elevated or there is above-average movement. For truly continuous HR tracking, you must enter Training mode.*
* **Setting power-save GPS mode:** On the watch, navigate (using the top and bottom right-side buttons) to "Settings", "General settings", "Sport Profiles", "Other outdoor", and "GPS recording". ("Other outdoor" is the sport profile we use for GPS tracking). Select "Power save, long session" and press Select (the middle button on the right side). After the confirmation messages are shown, press "back" to return to the main screen.

## Wearing the device

The M430 should be worn on the non-dominant arm, behind the wristbone. Do not put the watch over the wristbone or it will affect heart-rate acquisition. The watch can remain on the wrist indefinitely, and can be worn safely while bathing or showering for up to 30 minutes and to bed at night to monitor sleep.

## GPS acquisition

Training mode must be active in order to acquire GPS. To enable training mode, make sure you are starting on the Time screen (if not, press Back, the bottom-left button, until you get there). Press the Select button (middle button on the right side of the watch) once. Move up and down until you see "Other outdoor", and press Select again. You may see a warning message, and then recording will begin.

To deactivate GPS, hold the Back button. You will see a message counting down and then training mode will be ended.

Training mode can run up to 30 hours in power-save mode, during which time it acquires GPS once every 60 seconds. However, you should charge and sync the phone at least every 24 hours if GPS acquisition is going on nearly continuously. It is recommended to activate training mode on waking up in the morning, then deactivate, plug in and sync right before sleep.

## Syncing data

You can sync data through the Android phone or through the computer.

* To sync through the phone, ensure the smartwatch is in Time mode and then simply hold the Back button (bottom left on the watch) until you see the message that the devices are syncing.
* To sync through the computer, ensure the smartwatch is in Time mode and connect the watch to the computer using the supplied charging/data-transfer cable. You will be notified once the device has been synced to the software. The Polar Flow web app should start automatically after syncing.

# Schedule of repeating tasks

## Maintenance

* Charge and sync the smartwatch daily. The easiest way to do so is to simply plug it in to the computer at night using the data transfer/charging cable.
* Rinse the smartwatch in warm, mildly soapy water from time to time and after sweaty activity.

# Data retrieval

Go to the Polar Flow web app.

* On the Diary tab, you will see a calendar entry for every day that data has been acquired. Click on the day to see a list of Training sessions for that day, and click on the session to see a full visualization of the session, including statistics, route map (if applicable), heart rate and speed plots.
* On the bottom of the page for the Training session you will see a button labeled "Export session". Clicking this presents you with a number of download options, including .CSV for heart rate and .GPX for GPS.
* On the Sleep tab, you will see a nightly report of sleep actigraphy as well as statistics for sleep efficiency and fragmentation. At the current time, there is no export functionality for sleep data from Polar Flow.

# Data processing

*Section pending*

# Revisions

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| --- | --- | --- |
| **SOP Revision #** | **Date** | **Description of change(s)** |
| 170928 | 09/28/2017 | First version |