

## Connect the Android „nRF Connect mobile“ app with a Bluetooth Low Energy device

This is a simple manual for how to do the first steps when you're trying to examine a Bluetooth Low Energy (BLE) device using the app „nRF Connect for mobile“.

The app is provided for free and is available on Google's PlayStore using this link: <https://play.google.com/store/apps/details?id=no.nordicsemi.android.mcp&hl=de&gl=US>.

**Purpose of the app:** the app is extreme useful when you are developing a server or peripheral for the Bluetooth Low Energy technology or having a 3rd party device and you would like to know what services and data are provided by this device.

After downloading and starting the app the app is immediately scanning for BLE devices and will show a device in the „Scanner“ tab.

I used this app to communicate with my BLE Server app and the screenshots in this article were taken during development.

**Step 1:** start the server app or bring your external device in a „advertising mode“ so that it becomes discoverable for the nRF app.

**Step 2:** the nRF app has found the server running on my second smartphone. The name shown in the first line („SM-A515F“) is the name of my smartphone, a real device could show something like „Contour7901H12345678“ for a Glucose meter device. Click on the CONNECT button to proceed.

*Server01.png*

**Step 3:** The server is providing the general services like **General Attribute**, **Generic Access** and **Device Information** and 2 data services like the **Current Time Service** and a **Heart Rate Service**.

This service has (short) UUID „0x180D“ and the long UUID for the service is „0000180D-0000-1000-8000-00805f9b34fb“.

Now click on the **Heart Rate** entry to get the information of this service.

*Server02.png*

**Step 4:** We get the information for the **Heart Rate Measurement characteristic** with the "short" UUID „0x2A37“ (and long UUID „00002A37-0000-1000-8000-00805f9b34fb“).

The „arrow down“ symbol is a button that allow to **read** the data from the server. The „arrow down and up“ symbol is a switch for **en- or disabling notifications and indications**.

The „Descriptors“ below are responsible to handle notifications and indications.

*Server03.png*

**Step 5:** press the read button for the Heart Rate Measurement and receive a one-time value of 64 bpm.

*Server04.png*

**Step 6:** press the enable notification/indication button and notice that the value for the heart rate will change periodically (in this example every second). The Descriptors section will that Indications/NOTIFICATIONS are enabled.

The symbol changes and a second press will disable the notification/indication.

*Server05.png*

**Step 7:** doing the same with the **Device Information Service** you get the values for the Manufacturer Name and Model Number from the device/server.

*Server06.png*

**Step 8:** at least we choose the Current Time Service and there is a new „arrow up“ symbol for uploading data to the device. **Warning: Beware of typing any data in the input field and send them to the server, unless that you know exactly what data are expected.** In the best case you just get an error on writing but in the worst case you disable or destroy the device without any chance of a „reset“.

*Server07.png*

A last note when working with an emulated server/device running on a Smartphone (e.g. the BleServerBlessedOriginal): For security reasons the address the server can get connected is changing very often so when using a client app like the nRF Connect-app it is necessary to often (re)run a scan AND choose the newest entry (mostly the most bottom down one).