

# AmfiTrack Gen2 Development Kit - Getting started

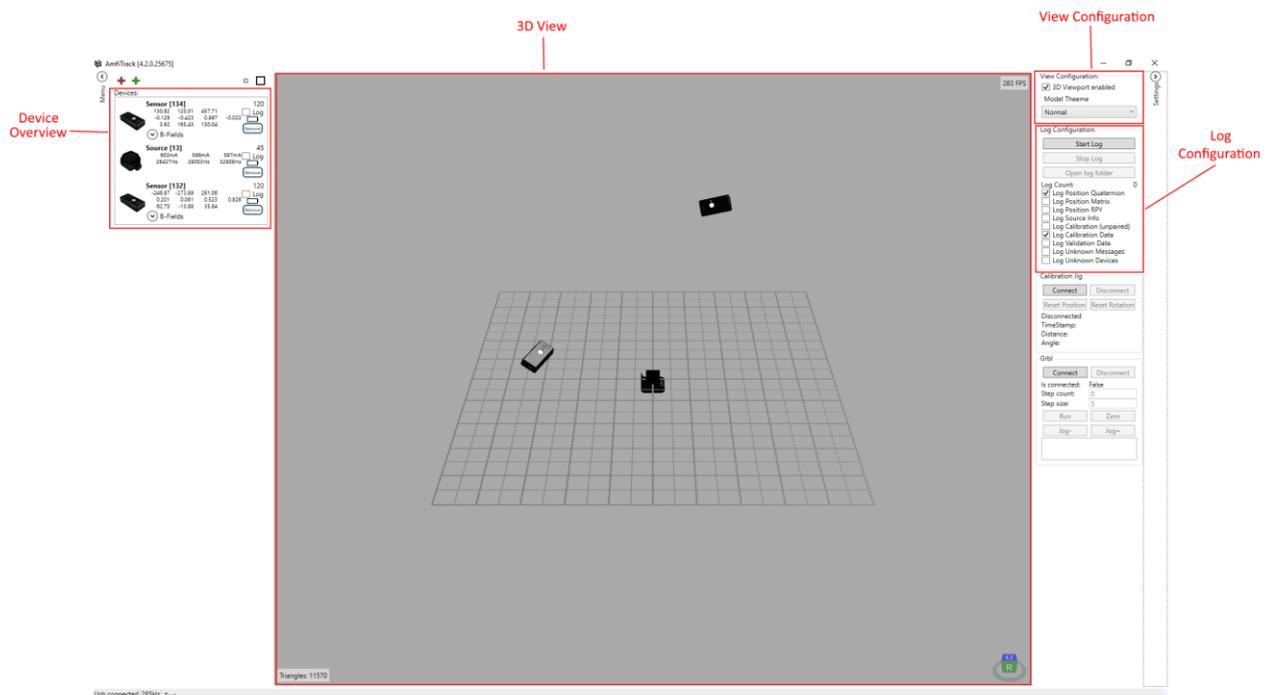
## 1. DOWNLOADING SOFTWARE, USB PROTOCOL, DATA LOGGING SCRIPT

Please follow this link in order to download the latest version of:

- This document
- AmfiTrack demo software "AmfiTrack Viewer"
- A USB protocol description
- Data logging python script
- AmfiTrack .NET .dll
- Minimal working example of AmfiTrack .dll

[http://www.amfitrack.com/SW/AmfiTrack\\_Gen2\\_Software.zip](http://www.amfitrack.com/SW/AmfiTrack_Gen2_Software.zip)

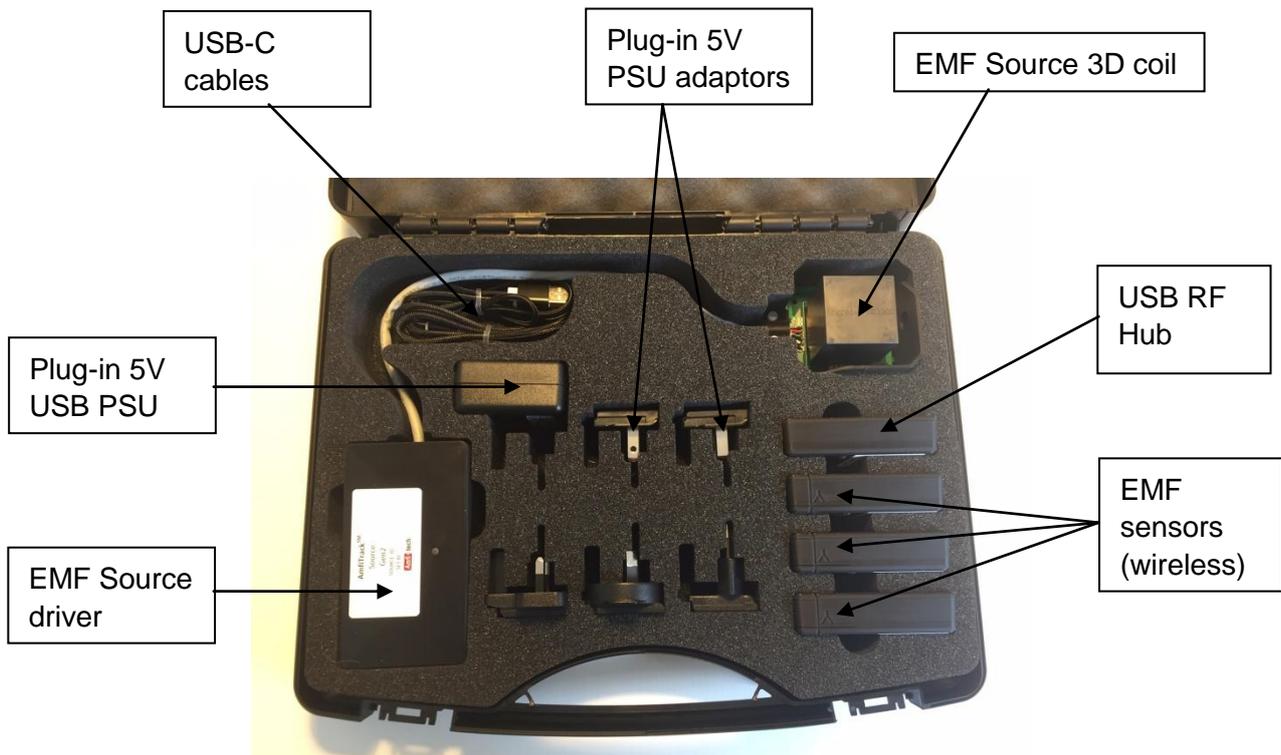
The AmfiTrack Viewer software is used when a visual representation of the tracking system output is necessary.



### 1.1. Drivers

A .NET .dll exists for AmfiTrack Gen2. A minimal working example is provided to get you started. The example makes use of the HidApiAdapter NuGet package, which is a .NET wrapper for HidApi. The .dll is, however, not dependant on this package, and you should be able to use any method of reading data from USB in your project.

## 2. COMPONENTS OVERVIEW



**EMF Source driver:** The EMF Source driver is hardware to the EMF Source coil, and powered from 5V through USB port or by using the 5V USB wall plug-in adaptor supplied with the system. Communicating with EMF sensors and USB RF hub is done using 2.4GHz proprietary RF link.

**EMF Source 3D coil:** Emits the EM field.

**EMF sensors:** The wireless EMF sensors pick up the EM field and calculate their position (6DOF) from the EMF source. Communicating with EMF Source driver and USB RF hub is done using 2.4GHz proprietary RF link. Sensors can be supplied with or without Kalman filter.

**USB RF Hub:** The USB RF Hub picks up the 2.4GHz RF link communication between the EMF Source driver and EMF sensors, and relays the system positioning data through its USB port.  
*Please note: The USB RF Hub is only needed to present positioning data from the wireless sensors on a PC. All positioning calculations are done embedded by the EMF sensors microcontroller.*

**Plug-in 5V USB PSU:** The Plug-in 5V USB PSU can be used for powering the EMF Source driver, and also for charging the EMF sensors.

**Plug-in 5V USB adaptors:** The interchangeable power supply adaptors allows the Plug-in PSU to be used with country specific wall outlets.

## **3. POWERING AND CHARGING**

### **3.1. Powering the source**

The source can be powered by 5V USB from either the supplied external plug-in USB supply or a PC USB port.

### **3.2. Turning the sensors on/off**

Turn the sensor ON: Hold the button for a few seconds, LED turns on.

Turn the sensor OFF: Hold the button for a few seconds, LED turns off.

### **3.3. Charging the sensor**

The sensor contains a rechargeable Lithium battery. The charging starts when the sensor is connected to a 5V USB power source (external 5V USB power supply or PC USB port).

Charging indication (when the sensor is powered off):

LED flashing white: Charging in progress

LED constantly white: Charging complete

A complete charge cycle of a sensor from 0-100% will take approx. 1 hour.

### **3.4. Sensor low battery indicator**

A purple LED light indicates sensor low battery.

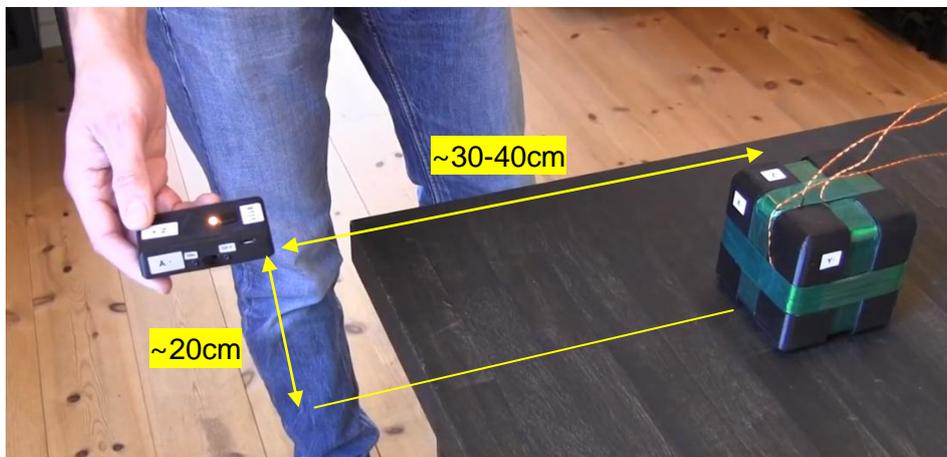
## 4. START-UP CALIBRATION

Please note that a start up calibration of the sensors are necessary after sensor power on, in order for the sensors to be start up calibrated and recognized by the system/software.

The sensor start-up calibration position does not need to be very precise at all, since it is a hemisphere calibration and not an absolute position calibration.

### **Start up calibration procedure:**

After powering the sensor on, the sensor LED will start flashing yellow, which indicates that it is not in the correct start up calibration position. Then place the sensor in the correct start up calibration position, which is approx 30-40 cm away from the EMF source X-axis, and 20-30 cm up from the source plane (Z-axis) (see picture below).



When the correct calibration position is found, the sensor LED will stop flashing yellow and light up constantly yellow. Then push the sensor button, and if start up calibration is successful, the LED turns green, and the sensor should now be visible in the AmfiTrack Viewer software.

Start-up calibration instructions (and more) can be found in this video (start up calibration @ 1:40 min):

<https://www.youtube.com/watch?v=X9ALvqmkmaM>

## 5. LED AND BUTTON FUNCTIONALITY

Device	Button	LED
Sensor	<p>Long press: Power ON/OFF</p> <p>Short press when ON: Execute Startup calibration (See doc section "start-up calibration)</p>	<p>Flash slow yellow: Sensor On and ready to startup calibrate. Place sensor in correct startup position.</p> <p>Flash fast yellow: Tracking lost because of too low or too high EMF field. Source might be off or distance to long, or sensor too close to the source (near-field)</p> <p>Constant yellow: Start-up calibration position correct. Ready to statup calibrate</p> <p>Constant green: Tracking running. All OK</p> <p>Flash fast green: Sensor is calibrated, but too close to the source (near-field)</p> <p>Constant purple: Battery low</p> <p>Flashing white: Battery charging</p> <p>Constant white: Battery fully charged</p> <p>Flash fast red: RF wireless link packet loss. Communication with Hub lost.</p> <p>Flash fast blue: Communication with AmfiProt PC config tool</p>
Hub		<p>Constant green: ON and OK</p> <p>Flash fast blue:</p>

		Communication with AmfiProt PC config tool
Source	n/a	Flash slow white: Booting (take app. 5 sec. on power up)  Constant Green: On and ready  Flash fast red: RF Packet loss. Communication with Hub lost.  Flash fast blue: Communication with AmfiProt PC config tool

## 6. UNITY DEMO

You can download the demo by going to:

<http://www.amfitrack.com/SW/AmfiTrackIslandDemoGen2.zip>

To run it, connect and calibrate Amfitrack as previously described. Unzip *AmfiTrackIslandDemo.zip*, and run *Amfitrack\_Unity.exe*

## 7. UNITY DEMO PROJECT

You can download the demo project by going to:

<http://www.amfitrack.com/SW/UnityDemoProjectGen2.zip>

To get started with the unity project demo, first you need to download and install unity from <https://unity3d.com>.

After installing, you should be able to build the provided demo project (made using Unity v2019.1.7f1).