User Guide: RTK Smart Antenna

Product Overview

The ArduSimple RTK Smart Antenna is designed for easy, high-precision surveying and mapping tasks with millimeter-level accuracy. It supports 3 primary modes: a Rover configuration (default) for collecting and staking out data in the field, a Base station configuration for delivering corrections, and a PPK workflow. It also includes an easy-to-use web interface for configuration and monitoring.

If this is your first time using your RTK Smart Antenna, follow this quick guide to get started.

Features New features will be added via firmware release to the RTK Smart Antenna.
If you miss anything, please **Contact Us** and let us know.
Important: This kit is designed for outdoor use in locations with an unobstructed view of the sky. Performance will degrade if used indoors, even when placed next to a window.

Package contents

The RTK Smart Antenna kit includes:

- IP67 waterproof transport case with custom foam to store all components.
- RTK Smart Antenna (featuring the ZED-F9P RTK receiver, IP65 waterproof).
- Compact clamp for surveyor pole.
- Phone holder.
- USB-C cable.
- Screwdriver.
- Thread adapter accessory for mounting the Smart Antenna to tripod poles.

IP67 Waterproof transport case

RTK Smart Antenna

Compact clamp for surveyor pole

Phone holder

USB-C cable

Screwdriver

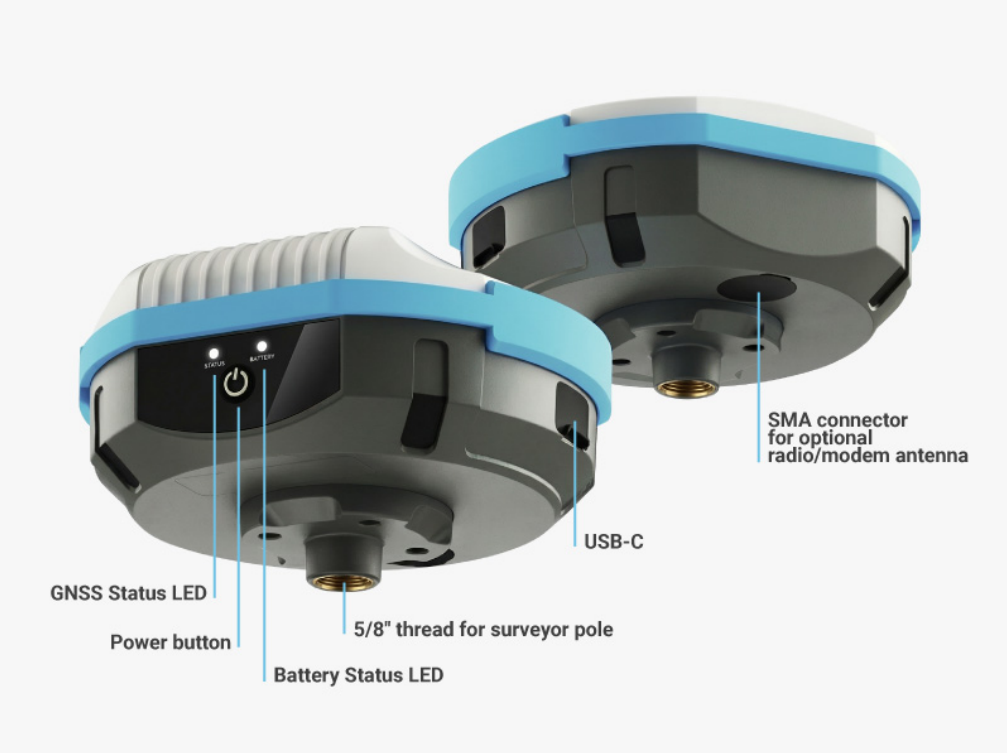
Thread adapter

Note:

- Surveying pole is not included but can be purchased separately here.
- This kit is also compatible with tablets (find our tablet holder here).

Getting started

The RTK Smart Antenna comes pre-assembled and pre-configured in its default Rover mode. Follow this quick guide to set it up.



Power button

Use the power button to:

- **Power On/Off**: Press and hold the button for 3 seconds. An audible tone will indicate the status change.
- **Check Battery (Unit Off)**: Short press the button to display the current battery status.

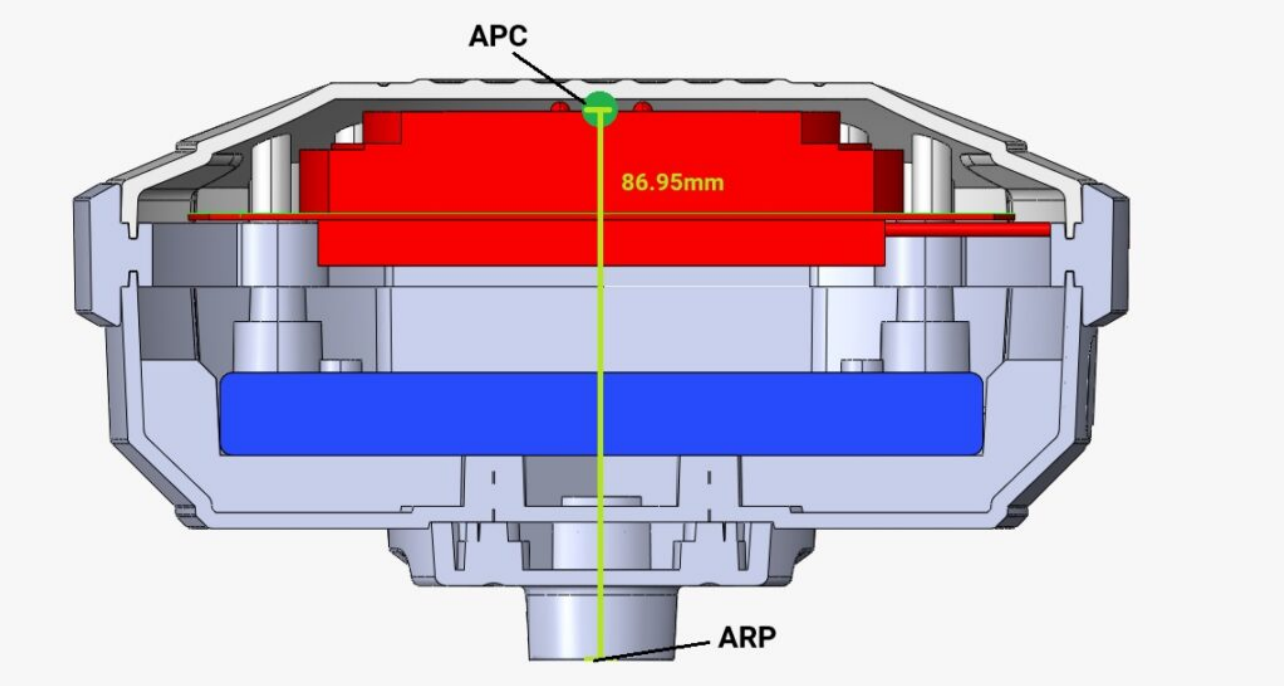
Front panel LEDs

The RTK Smart Antenna has two LEDs on the front panel:

Status LED	Battery LED
🔴 No Fix	🔵 Battery fully charged
⚪ 3D Fix (no RTK)	🟢 / 🟢 Battery >30% (blinks when charging)
🟠 RTK Float	🟠 / 🟠 Battery >10%
🟢 RTK Fix	🔴 / 🔴 Battery

Smart Antenna Geometry

The RTK Smart Antenna APC (Antenna Phase Center) is located 86.95mm from the ARP (Antenna Reference Point), which is located at the bottom of the unit, as can be seen at the below picture.



Configuration

As RTK Rover

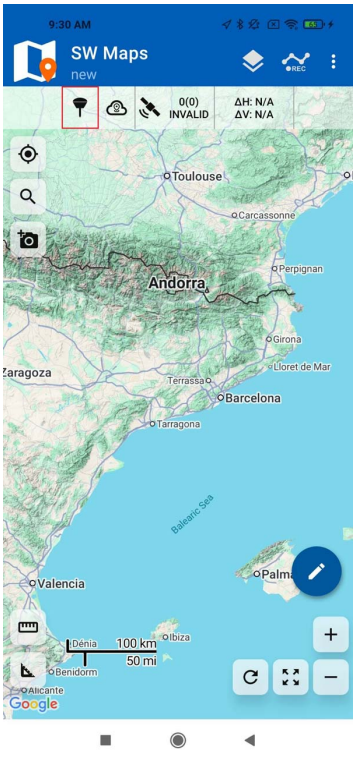
on Android or iOS

Select Set as Rover via RTK Smart Antenna web interface.

You can additionally enable Raw data and Use radio options.
By default, don't enable these unless you need them.

This kit is compatible with numerous mobile GIS apps. This tutorial uses the **SW Maps** app to demonstrate how to connect the RTK Smart Antenna to your **Android** or **iOS** device.

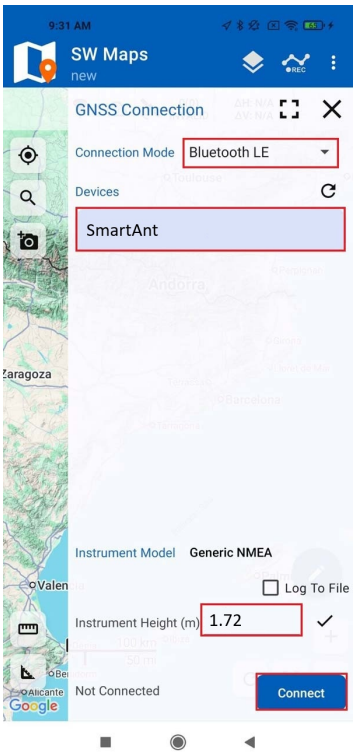
1. Install SW Maps app on your mobile device from the Google Play or Apple App store.
2. Open the app and grant the required permissions (first time only).
3. Power on the RTK Smart Antenna by pressing the **POWER** button on the front panel.
4. In SW Maps, tap the **antenna icon** to open the GNSS Connection menu.



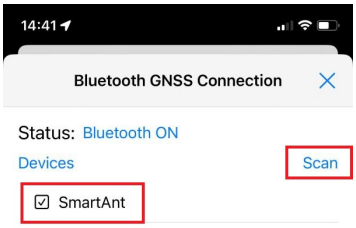
Android

iOS

5. In the GNSS Connection menu:
    - Set Connection Mode to **Bluetooth LE** and press the **refresh icon** (Android only).
    - Press **Scan** (iOS only).
    - Make sure to select the device named **SmartAnt**.
    - Instrument Height refers to the expected receiver elevation from the ground. Set the instrument height to the exact **height of the pole + 87mm** (this is the distance between the bottom of the 5/8? thread and the phase center of the internal antenna).
    - Press **CONNECT**.

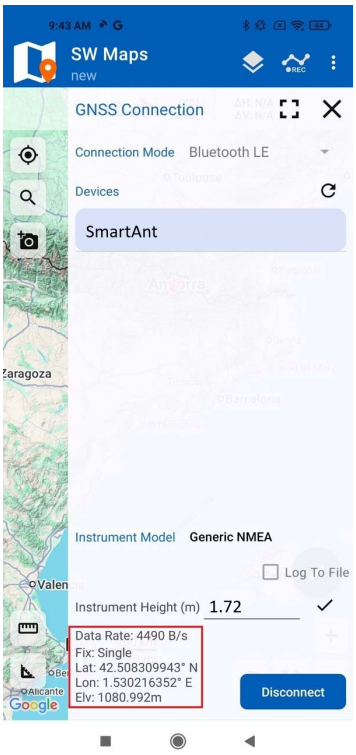


Android

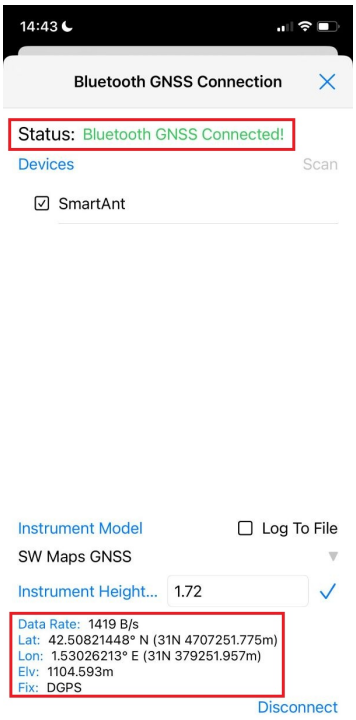


iOS

6. You should now see a confirmation of a successful connection and data transfer from the RTK Smart Antenna.

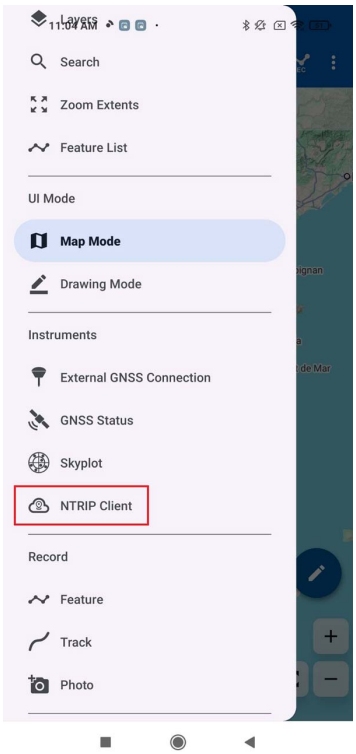


Android

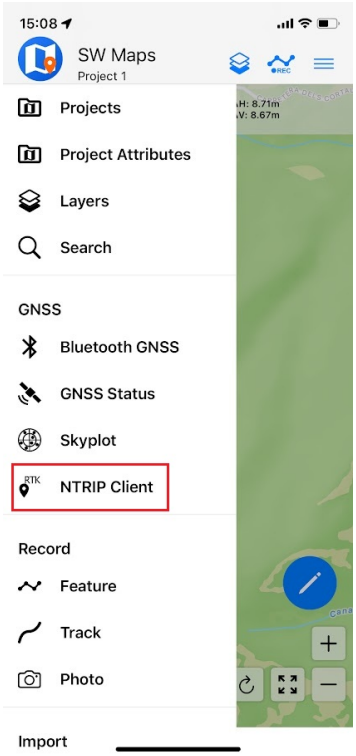


iOS

7. For centimeter-accurate measurements, you must connect to an NTRIP service to receive RTK corrections. If you need assistance finding one, consult our prepared list of RTK correction services in your country.
8. Next, return to the SW Maps main menu and select **NTRIP Client**.

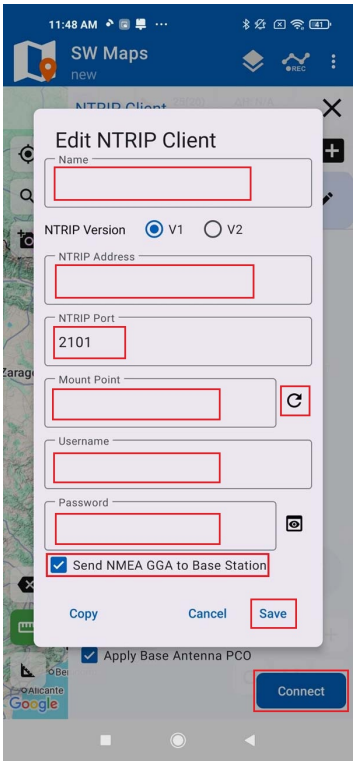


Android

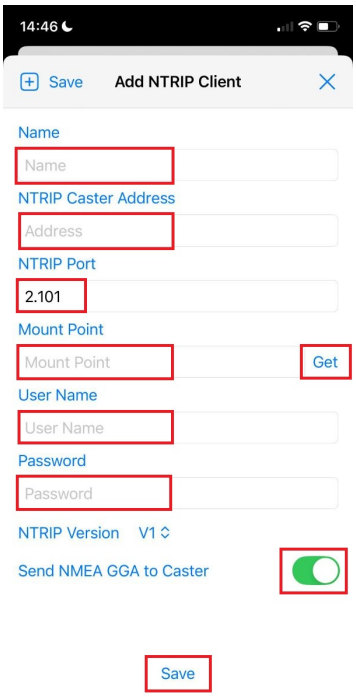


iOS

9. Enter your NTRIP Client credentials: **Name, NTRIP Port, Mount Point, Username** and **Password**. We recommend enabling **Send NMEA GGA to Base Station** option to send your location to the NTRIP caster.
10. Press **Save**.
11. Press **Connect**.

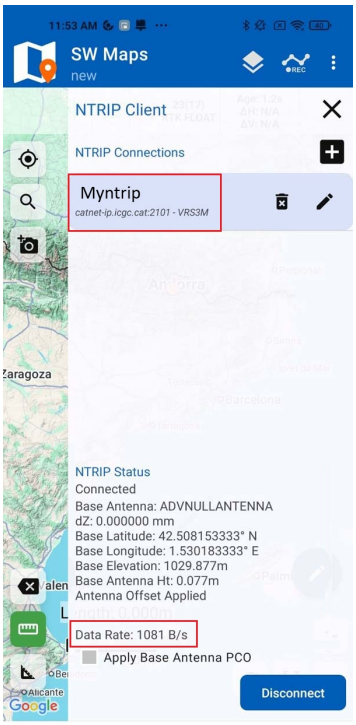


Android

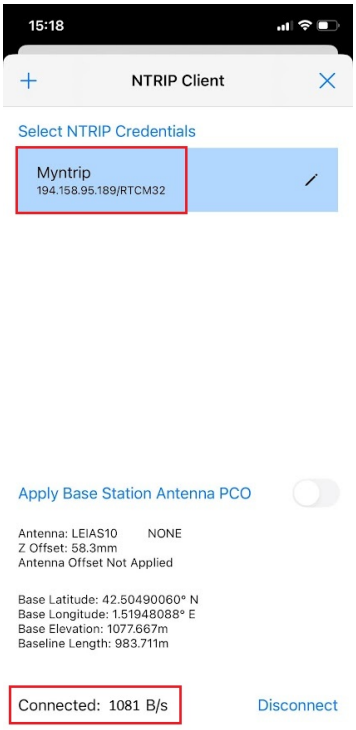


iOS

12. The **NTRIP Status** section will show a confirmation of a successful connection and active data streaming to your device.

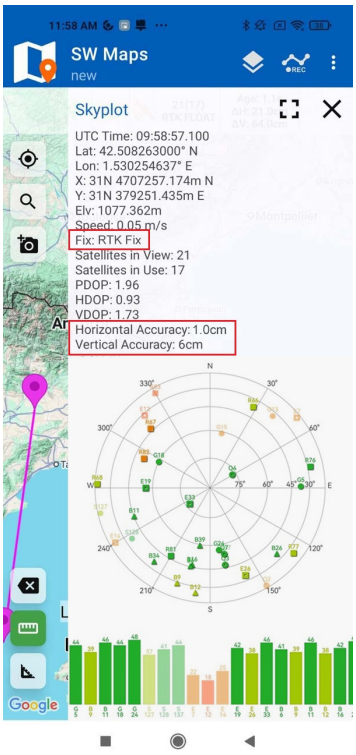


Android

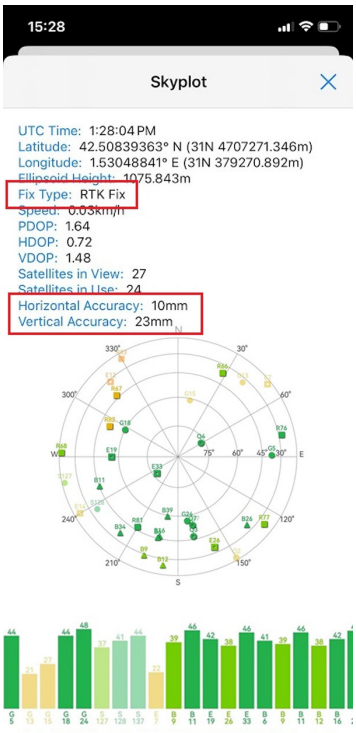


iOS

13. Navigate back to the SW Maps main menu and tap **Skyplot**. You should now see the number of available satellites at your position, **Fix** status to **RTK Float/Fix**, and millimeter-level **horizontal and vertical accuracy**.



Android



iOS

The RTK Smart Antenna supports integration with a wide range of third-party software and applications. Please consult our Compatible Software list for supported apps and related tutorials.

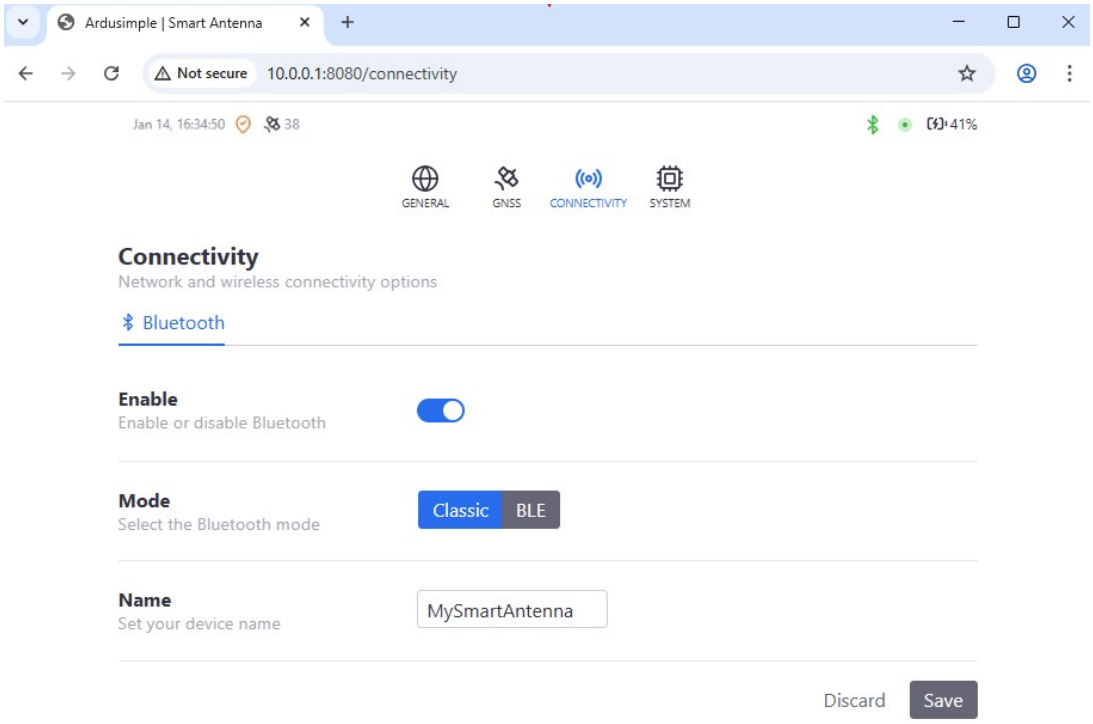
If your preferred application is not listed, please contact us, and we will test the integration for you.

on Windows

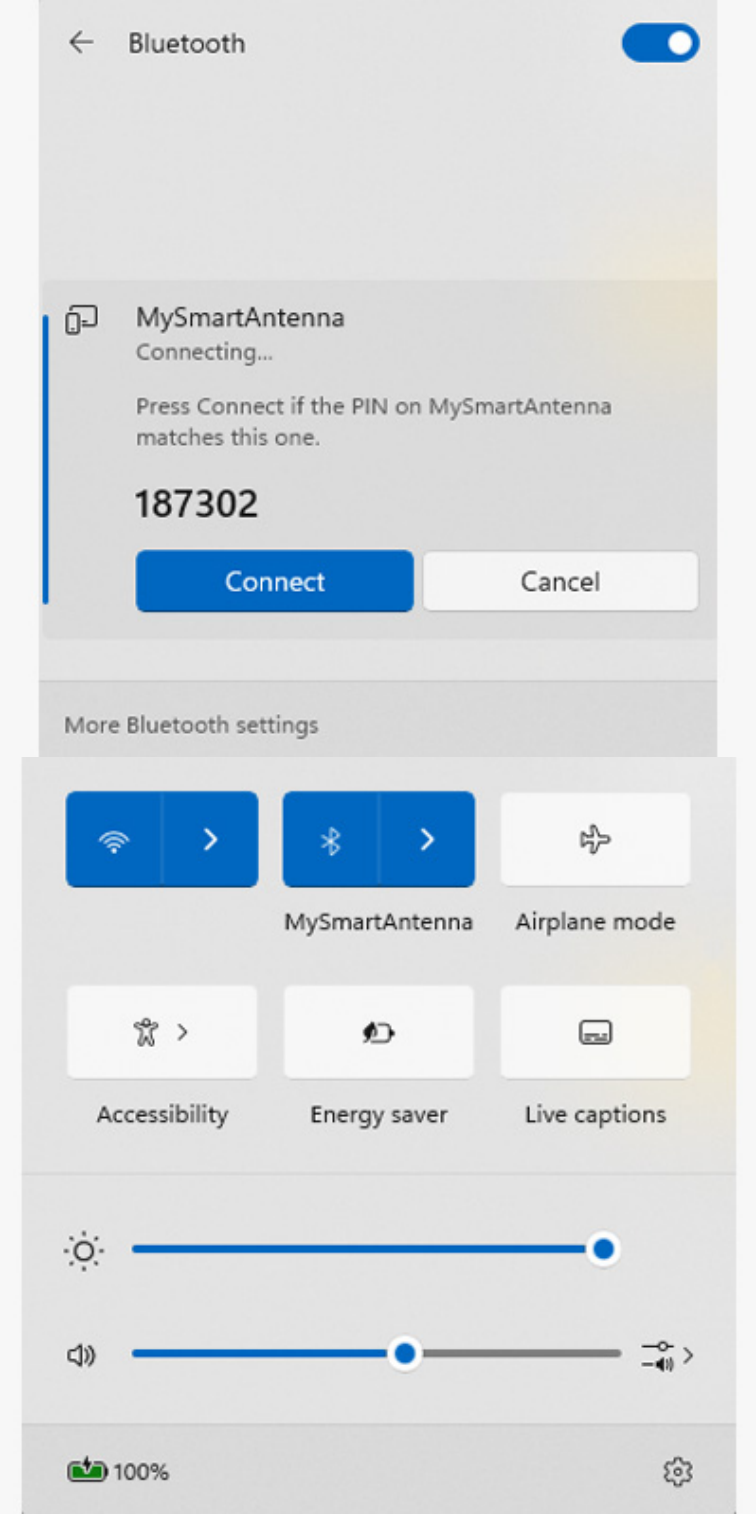
There are numerous GIS applications for Windows that are compatible with the RTK Smart Antenna Kit, but in this step-by-step tutorial we will explain how to connect it to a Microsoft Windows to obtain centimeter accurate positioning in the software developed by the embedded receiver manufacturer u-blox.

If you want to use on Linux or Mac computer check our tutorial How to install u-center on Ubuntu and How to install u-center on macOS.

1. To connect the RTK Smart Antenna to a PC it needs to be configured to use a **Classic Bluetooth connection** (instead of the default BLE connection). So, you will have to change it in the Connectivity section of the Web Interface. Please follow the corresponding section in this guide to do so.



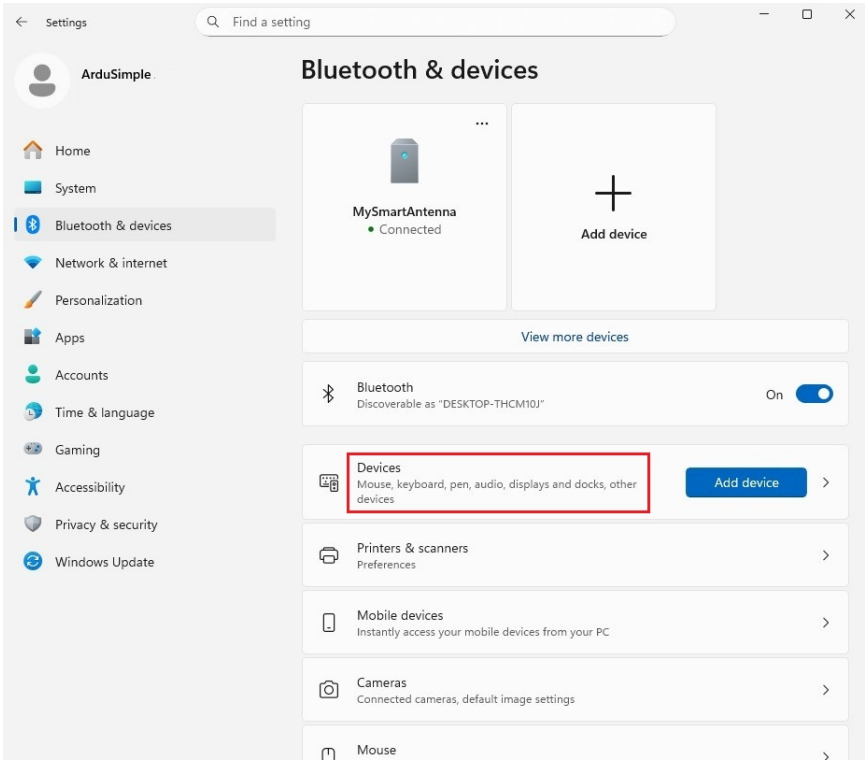
2. Once the Bluetooth Classic mode was activated and saved (RTK Smart Antenna is re-booted), please disconnect the USB-C cable.
3. Turn on the RTK Smart Antenna by pressing and **holding for 3 seconds the Power button**. Make sure your RTK Smart Antenna is charged (see the Battery section if charging is needed).
4. Place the RTK Smart Antenna outdoors in an open area with a **clear view of the sky**. For testing purposes, you can place it near a window.
5. Activate Bluetooth in the PC and search for a device called “Smart Antenna” (or the name you used in the Name section of the web interface; MySmartAntenna in the picture below) and press **Connect**. (Ignore the PIN number… it is not used in this tutorial).

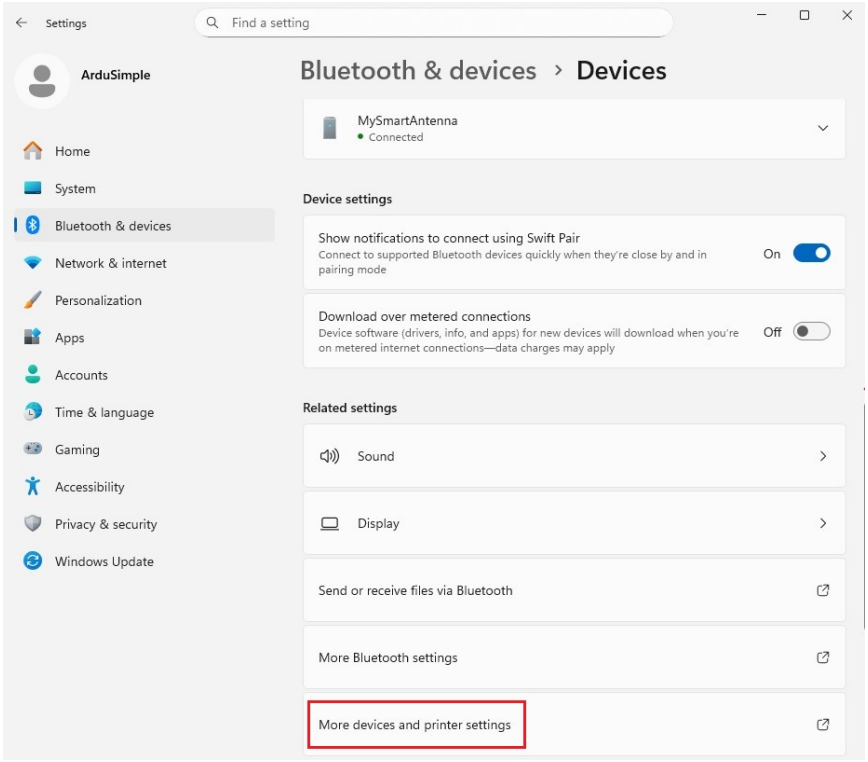


7. We will use **u-center** (version for M8, M9, F9 and legacy GNSS products) software to connect to an NTRIP service and get RTK corrections, so if you don' have it installed please download it from the u-blox website.

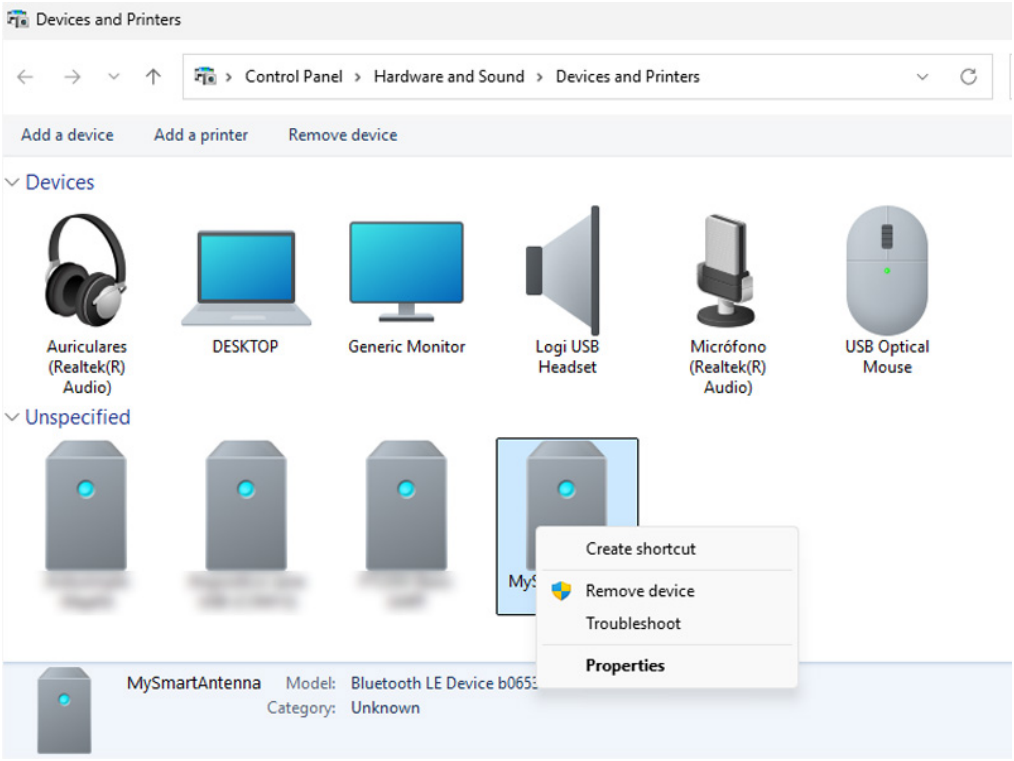
- Download the classic u-center software for legacy GNSS products, not the new u-center 2.
- Do not change additional parameters in u-center aside the ones included in this guide, as they could alter the functionality of the RTK Smart Antenna.

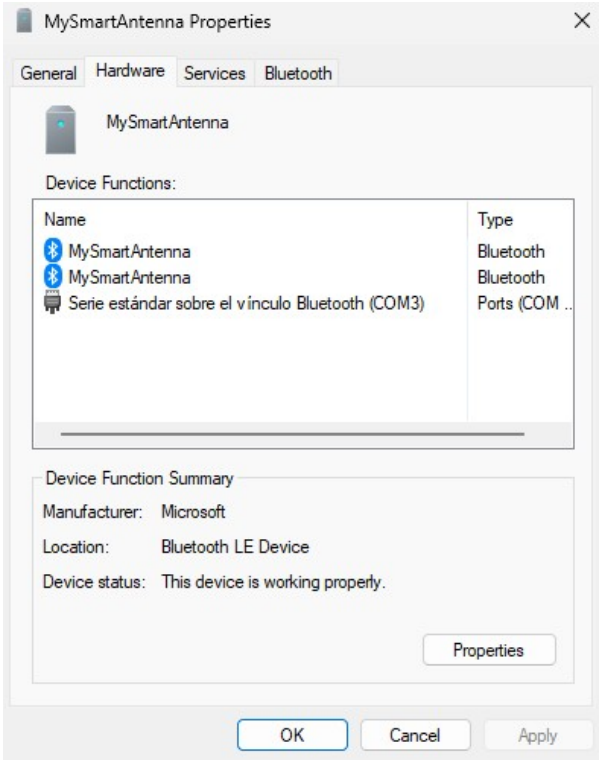
8. To identify which Bluetooth COM port your device is using. Go to PC **Settings -> Bluetooth & Devices -> Devices -> More devices and printer settings**.



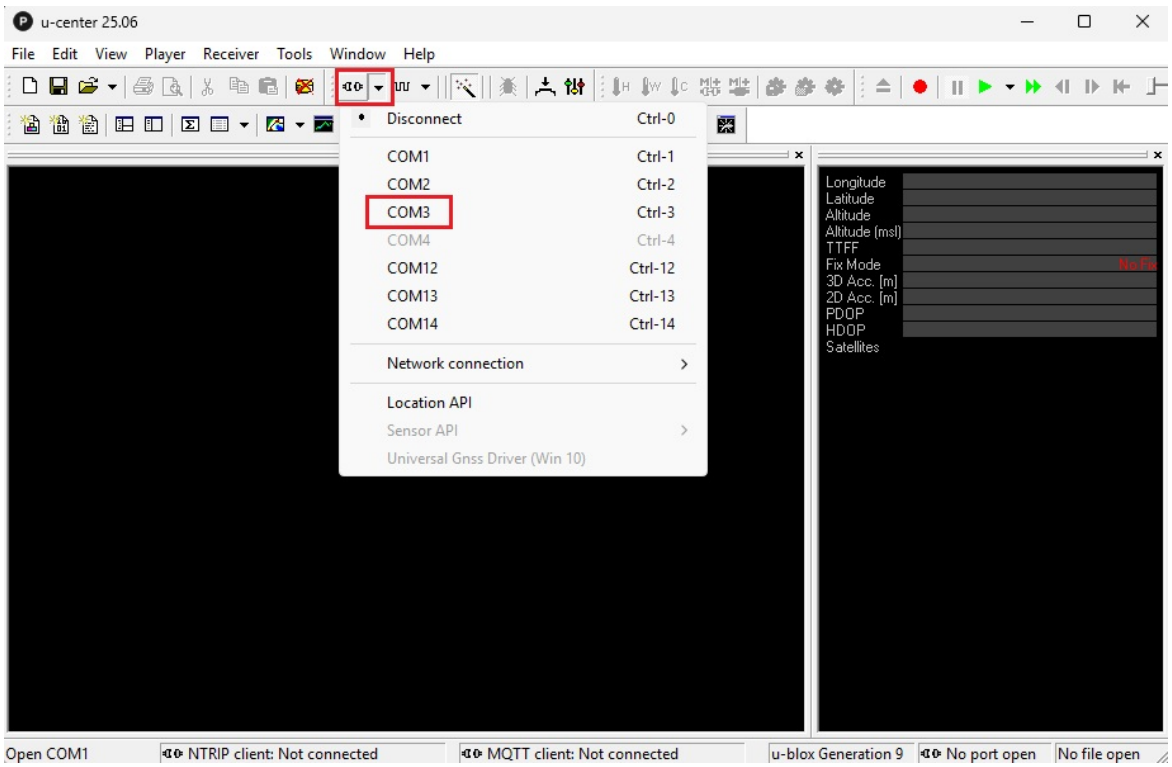


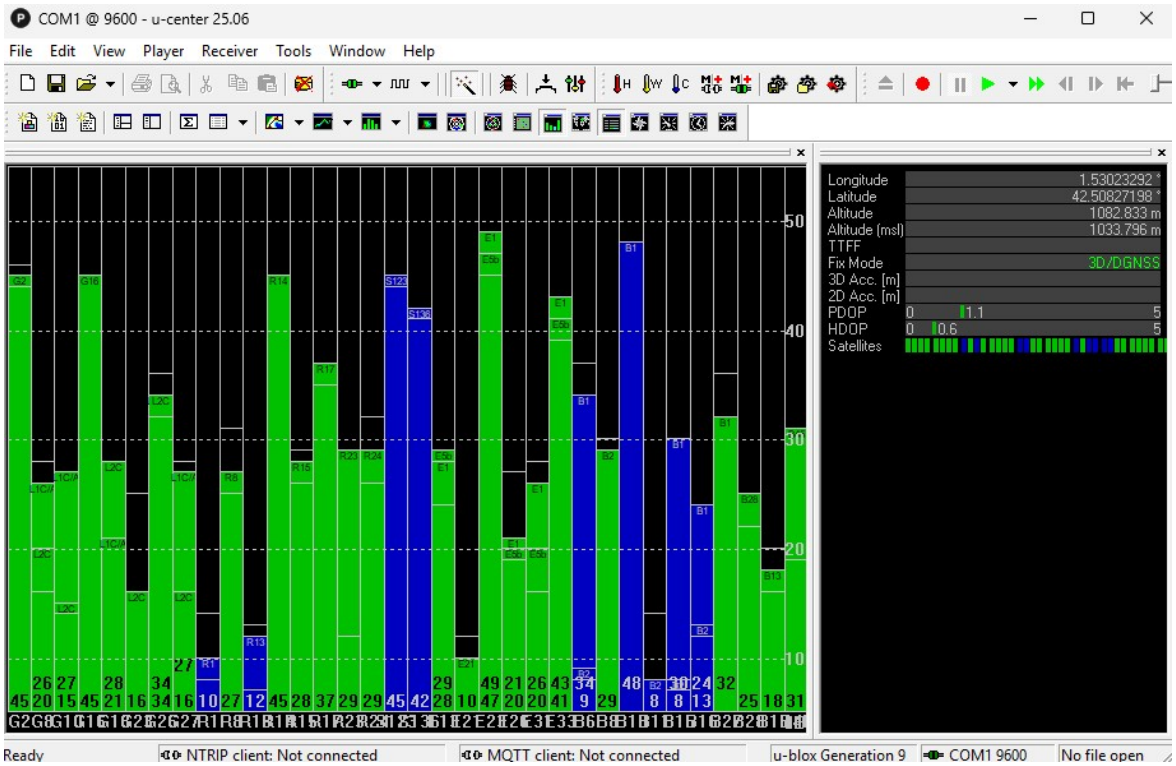
9. Select the **Smart Antenna device** and show its properties. Under the **Hardware tab** you will find the Bluetooth COM port used (COM3 in our case).



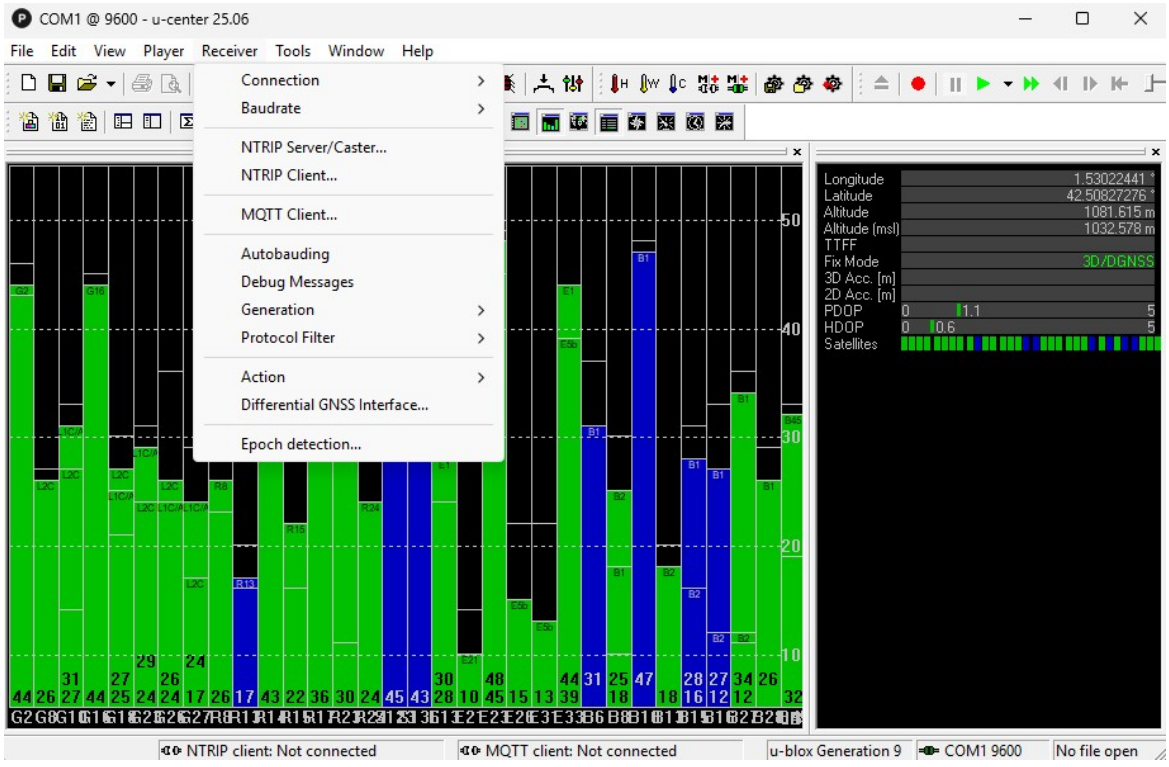


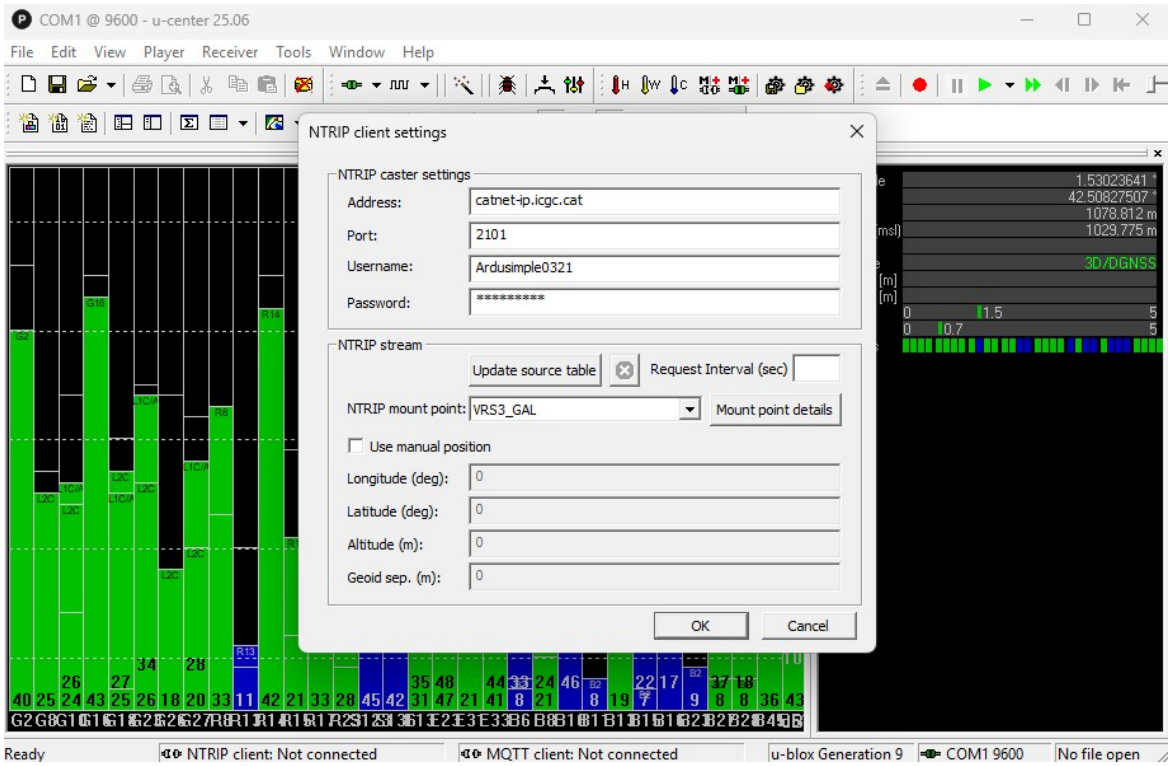
10. Open u-center and connect using the Bluetooth COM port you found in the previous step (COM3 in our case). You should see satellite signals and 3D Fix Mode in the Satellite levels and data views.



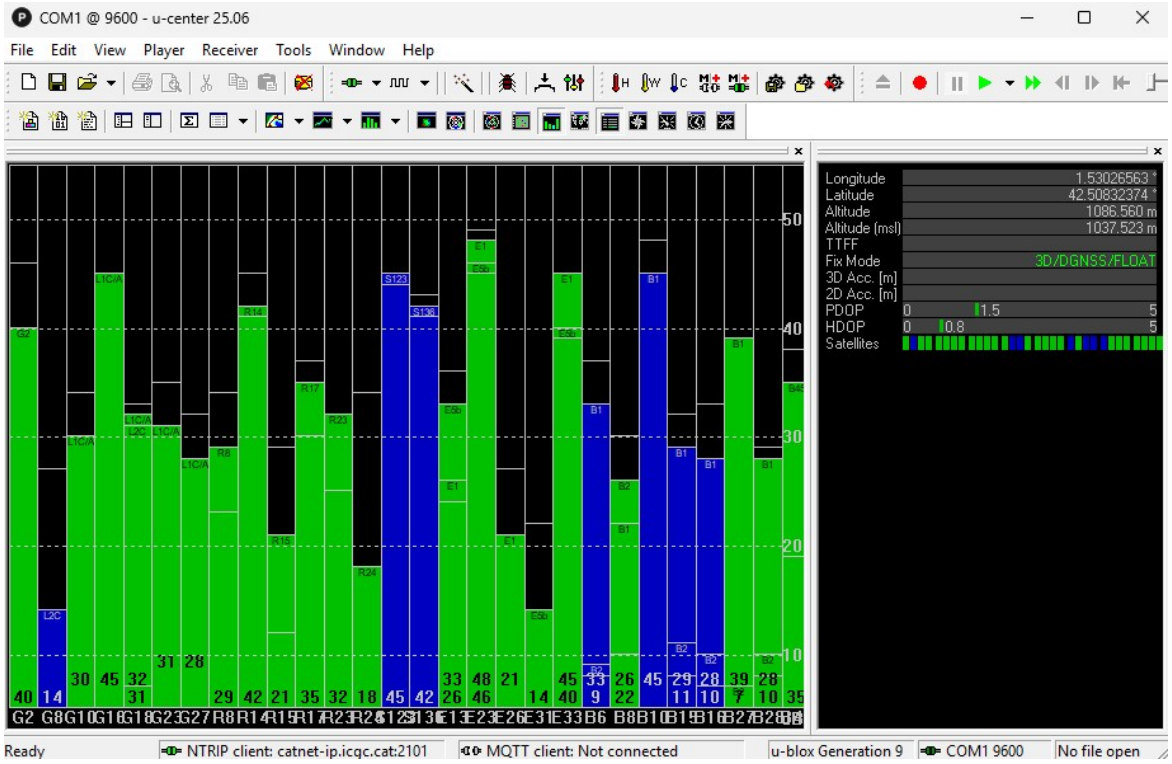


11. To get centimeter accurate measurements, it is needed to connect to a NTRIP service to get RTK corrections. If you need help to finding one, check the list of RTK Correction Services in your Country which we have prepared for you. At menu bar go to **Receiver –> NTRIP Client…** Set up the **A**ddress, Port, Username, Password and Mount point from your NTRIP service. Click **OK**.





12. In a few seconds, you will see the Fix Mode switching to RTK **FIXED** or **FLOAT** and 2D/3D accuracy changing to centimetre level.



At this point you can use the new RTK resolved position to improve the accuracy of your measurements in any other GIS application for Windows. For example, here you can find How to connect to QGIS for real time positioning.

As RTK Base

Select Base Set as Auto or Set as Fixed via RTK Smart Antenna web interface.

Currently, RAW data generation when Base configuration is active is not possible. Coming soon.

Unmanaged

Select this option to bypass the auto-configuration of the GNSS receiver.
You can setup your GNSS receiver with u-center/UPrecise/Septentrio web interface with your preferred configuration.

If Unmanaged configuration is selected, the web interface will not show the GNSS receiver model.
If you want to see data via web interface, please enable NMEA GGA, GST, GSV, GSA and RMC messages via UART1 at 115200bps.
If you want to transmit data via Bluetooth/Radio socket, set UART2 at 460800bps with your preferred messages at your preferred frequency. You are responsible to don't overload the UART buffer.

Enable the Use radio option if you want to forward all the UART2 data also over the radiolink socket of the RTK Smart Antenna.

If you want to go back to default configurations (Rover, Base), you only need to set your GNSS receiver to its factory settings.

Specifications

USB-C Connector

This connector is located on the right side of the RTK Smart Antenna (under a rubber cover). It serves two functions:

- Charge the internal battery.
- Connect the RTK Smart Antenna to a PC for configuration using our unified web-interface, or for advanced settings using tools like u-center, RxTools, …

Battery

The RTK Smart Antenna has a built-in Li-Ion battery that should be charged using the provided USB-C cable connected to a power bank or USB wall adapter.

The Battery LED on the front panel will blink during charging and remain solid when the battery is fully charged.

5/8" thread for surveying pole

This is the standard survey pole thread size, making the antenna compatible with any standard survey pole for field use.

For optimal performance, we recommend the ArduSimple Pole for survey GNSS antenna.

Web interface

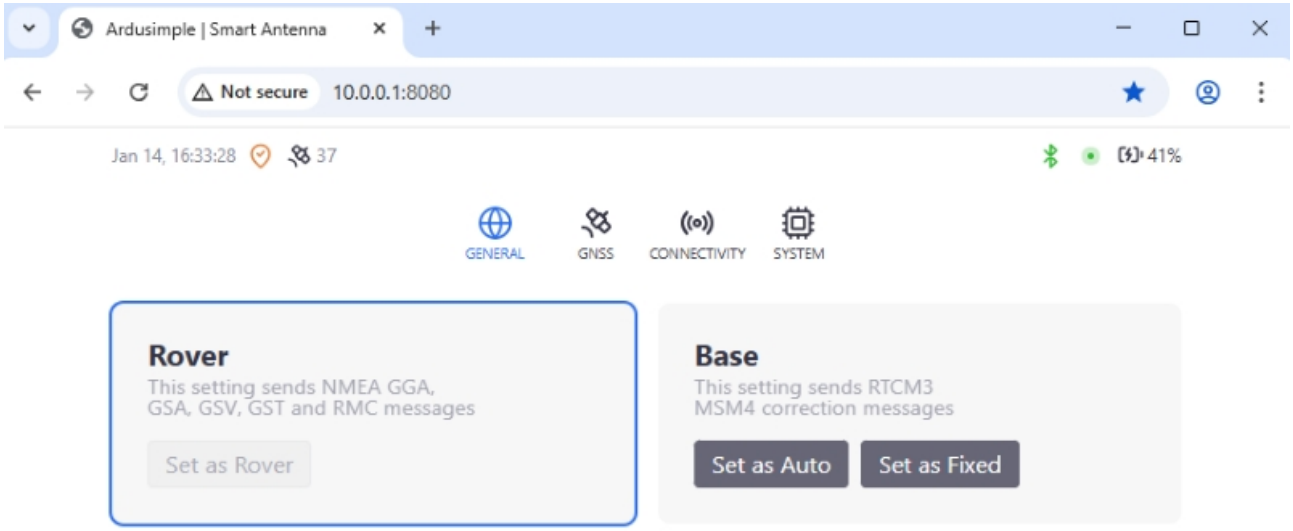
The RTK Smart Antenna features a unified web interface (common to all supported u-blox, Unicore and Septentrio modules) with an intuitive design for:

- Easy configuration of the device as a Base or Rover.
- Firmware updates.
- Monitoring GNSS signals and resolved position status.

To access the web interface:

- Remove the rubber cover from the USB port located on the right side of the device.
- Connect the antenna to your PC using the provided USB-C cable.
- Open a web browser and navigate to http://10.0.0.1:8080.

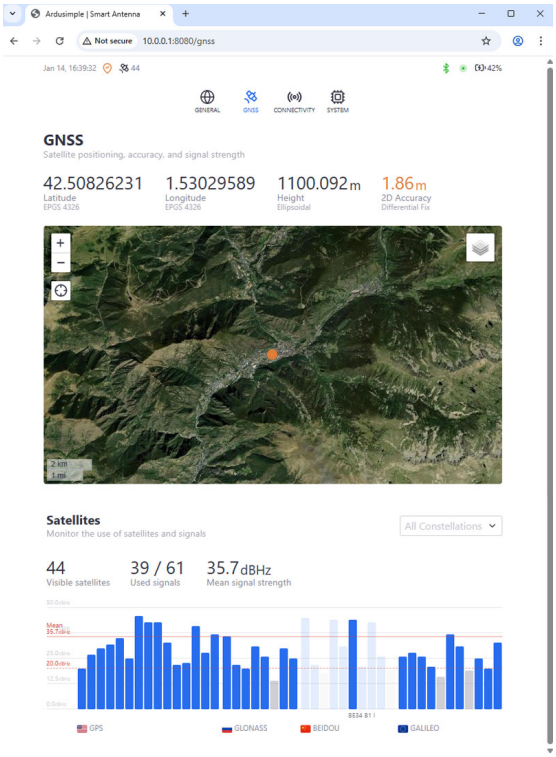
General



In the General section of the web interface, you can easily switch the RTK Smart Antenna's operating mode.

- **Rover**: This mode configures the receiver to output standard NMEA messages.
- **Base**: This mode enables the device to broadcast RTK correction data to connected Rover receivers. You can set the Base position automatically or by entering coordinates manually.

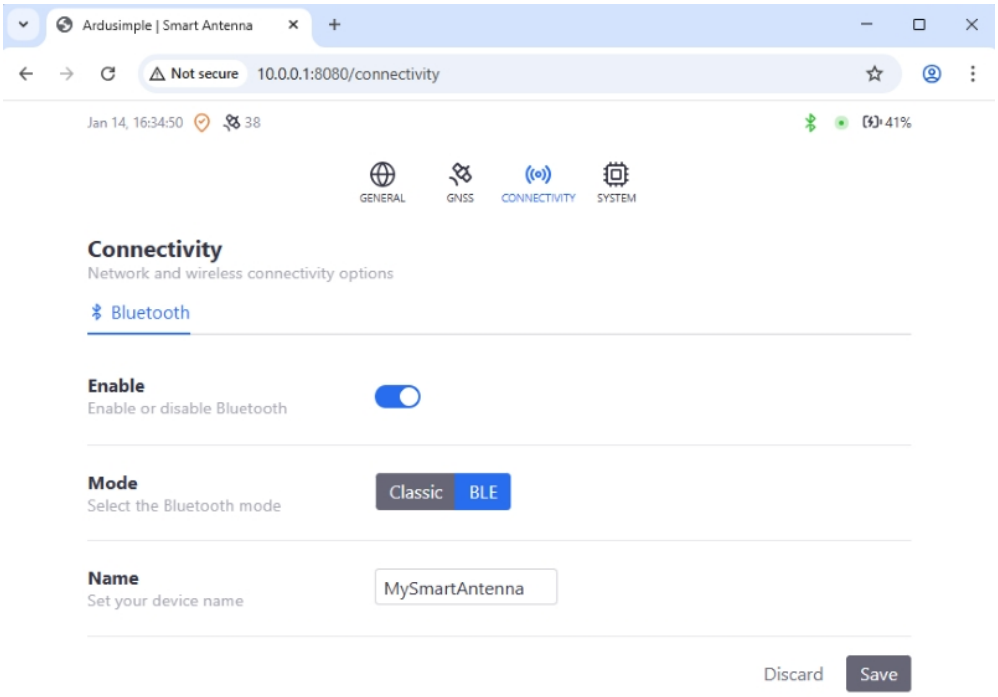
GNSS



The GNSS section of the web interface is used to monitor the satellite signal status, quality, and the position fix resolved by the RTK Smart Antenna's internal receiver.

- **GNSS**: Displays the current position coordinates and their accuracy.
- **Map**: Allows you to track the resolved position, zoom in/out, and choose between a default map view and a satellite image view.
- **Satellites**: Shows the number of visible satellites (per constellation) and the signal strength of those in use.

Connectivity

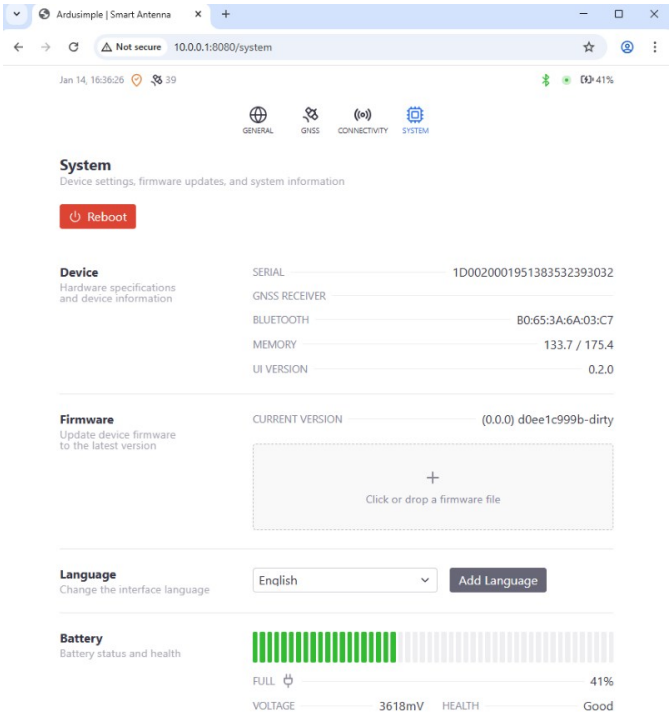


The Connectivity section of the web interface is used to configure the connection (**Bluetooth**) used between the RTK Smart Antenna and mobile devices used in surveying tasks.

- **Enable**: Activates the Bluetooth connection.
- **Mode**: Allows you to choose between Classic Bluetooth (used on PC) and BLE (Bluetooth Low Energy used for Android and iOS devices). BLE is the default and recommended option unless not supported by the connecting device.
- **Name**: Here you can type your desired device name, that will appear as a connection option on the mobile device.

Remember to press **Save** to apply the changes.

System



The System section of the web interface is used to configure the main functionality of the RTK Smart Antenna.

- **Reboot**: Resets the device.
- **Device**: Hardware specifications of the device components.
- **Firmware**: Used to update the device firmware version.
- **Language**: Choose your preferred language for the web interface.
- **Battery**: The state of charge and health of the built-in battery.

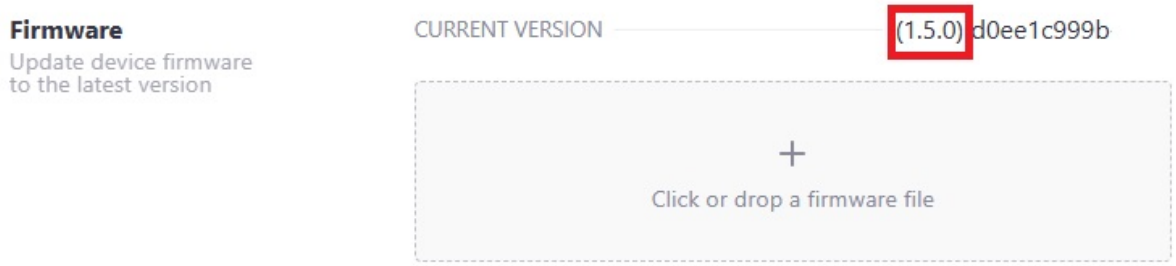
Firmware

The RTK Smart Antenna is a product under continuous development.
We will add features over time and you can easily upgrade your existing product.

Installed firmware version

First of all, you need to check the actual firmware version you are running:

1. Connect the RTK Smart Antenna to your PC via the USB connector
2. Open your browser and go to http://10.0.0.1:8080/
3. Go to the System tab, you will find the firmware version here:



Update firmware instructions

In the section below you will find the latest firmware as a **.tar** file.

1. **Make sure the RTK Smart Antenna is powered off**
2. Connect the powered off RTK Smart Antenna to your PC via the USB connector
3. Open your browser and go to http://10.0.0.1:8080/
4. Go to the System tab, go to the Firmware section and click (or drop) and select the .tar file with the latest firmware

Important: Once you select the firmware, the upgrade process will take place automatically.
It is important that you don't disconnect the Smart Antenna from the PC, the whole process takes around 5 minutes, go grab a coffee and be patient ?
The RTK Smart Antenna will restart automatically. Once ready, if you refresh the web interface system page, you should see the new firmware version displayed. After that, you can safely disconnect the unit from your PC.

Latest firmware and changelog

Last version: ***FW v1.8.1*** updated on 29/04/2026
Changelog

*** RTK Smart Antenna Changelog ***

2026-04-29 - FW V1.8.1
* Fix: web interface stability issue

2026-04-28 - FW V1.8.0
* Hardware revision automatic detection
* Improved battery capacity estimation as function of voltage and temperature
* Fix: stability improvements when upgrading firmware

2026-04-02 - FW V1.7.17
* Fix: Smart Antenna can be disconnected form charging on all conditions and will power off automatic
* Improvements in battery voltage reporting at UI

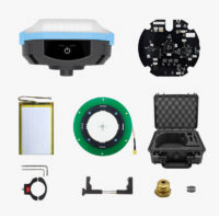
2026-03-09 - FW V1.7.15
* RAW messages implemented
* Radio socket enable/disable in unmanaged configuration
* Stability fixes in UI

2026-02-02 - FW V1.7.10
* Intelligent battery charging x3 speed
* GNSS -> radio socket communication is optional. This is useful for base-rover setups with radiolinks
* Unmanaged configuration, to allow customers to use their own setups (5Hz, extra messages, ...)
* Several fixes

2026-01-21 - FW V1.6.0
* First release

Accessories and spare parts

You may also need:



Made in Europe Professional **Smart Antenna spare parts**

Accessories **Tablet holder**

Accessories **4 Section Pole for survey GNSS antenna**

Accessories **Bipod for surveying pole**

Accessories **Pole for survey GNSS antenna**

Accessories **Tripod for surveying pole**

If you need additional information beyond this integration guide, such as adding Radio plug-ins or creating custom Base-Rover configurations, please refer to our Tutorials Page.