



# Users Manual

Connect the future



**Bacom Software**

**v1.14  
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# Introduction

Thank you for purchasing the BacomRTK ! Over the years many receivers and their modems will have problems receiving their RTK correction data because their modems work on the 2G or 3G wireless cell phone network, which will be disabled in many countries in the years to come.

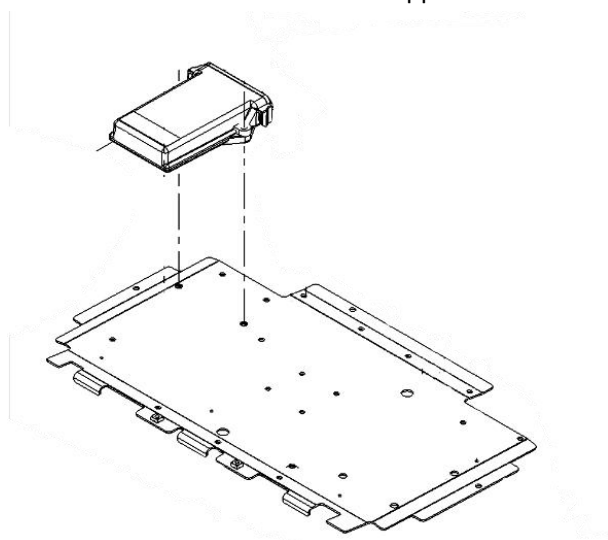
Bacom Software has been working on a solution that makes it extremely easy for you to keep your existing receiver and let it work for many years to come. It has some very nice features :

- ❖ Since the BacomRTK uses your mobile phone's hotspot to connect to the internet over WiFi, it makes the device very future proof. In time, 4G will be replaced by 5G and development of a 6G network is currently ongoing. Mobile phones are also designed for the most optimal connection.
- ❖ You do not need a separate SIM Card , disabling the costs for an extra subscription, with often monthly fees in times that you don't even use it (winter times).
- ❖ In areas where there is very little to no cell phone coverage, Starlink can be used as a hotspot for the BacomRTK modem.
- ❖ It's designed to work with a broad spectrum of receivers (see **section 3 : Receivers**) , and more will be added in the future.
- ❖ Installation is extremely easy : plug the device into the desired port on the receiver or cable loom , and scan the QR code with your phone's camera. A settings page will be opened where you can easily set all (See **section 1 : Installation**)
- ❖ New software updates are very easy : When a new version is available, there will be a notification on the settings page. Just select 'Upgrade' and the device will be downloading and installing it's new firmware at the next startup.

# Section 1 : Installation

## 1.1 Mounting the device

The circuit board is built into an IP67 enclosure, so it can be installed inside or outside the cab . The mounting holes should be compatible with most GPS receiver mounting plates , they have the correct footprint holes to bolt the device. Bolts are supplied.



If there is no way to mount the device on the mounting plate, make sure it's mounted on a flat surface, otherwise the enclosure can break. When mounted outside of the cab, it's advised to have it installed with the connector faced downwards.

## 1.2 Installing the cables

BacomRTK needs to be ordered with the correct cable for your receiver , separate cables can be ordered on the webshop. (<https://shop.bacom.be>)

### 1.2.1 Trimble AG372/AG382/AG482 Direct connection



The BacomRTK cable for Trimble AG372-AG382-AG482 has the same plugs on each end. Be very careful to read the marks on the plugs to put them in the correct port, otherwise both devices can be permanently damaged !



Remove the blind black plug on the right side (Port B) from the receiver and plug the cable into this port. It cannot be plugged incorrectly , do not use force .

### 1.2.2 Topcon AGI4

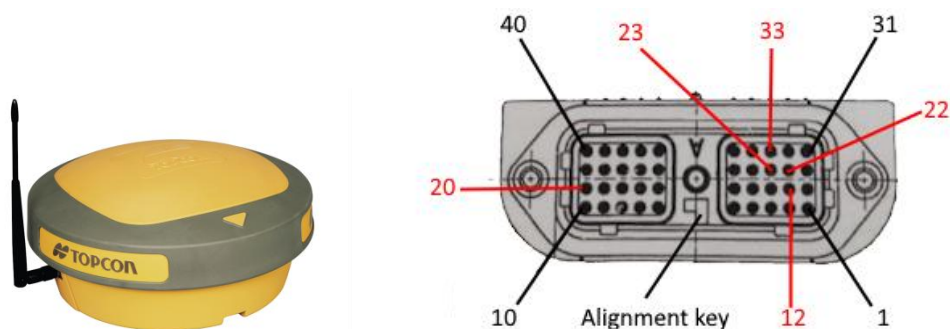


Remove the blind black plug from the receivers port B (right side) and plug the cable into this port. It cannot be plugged incorrectly , do not user force .

If your Topcon does not send out NMEA data on port B , ask your dealer to setup the receiver or you can do this yourself with the USB to Serial adapter cable and the TRU software . The cable can be ordered on the web shop and a link to the Topcon software with instructions on how to use it can be found on the website : <https://www.bacom.be/topconrtu>.

### 1.2.3 Topcon AGI3

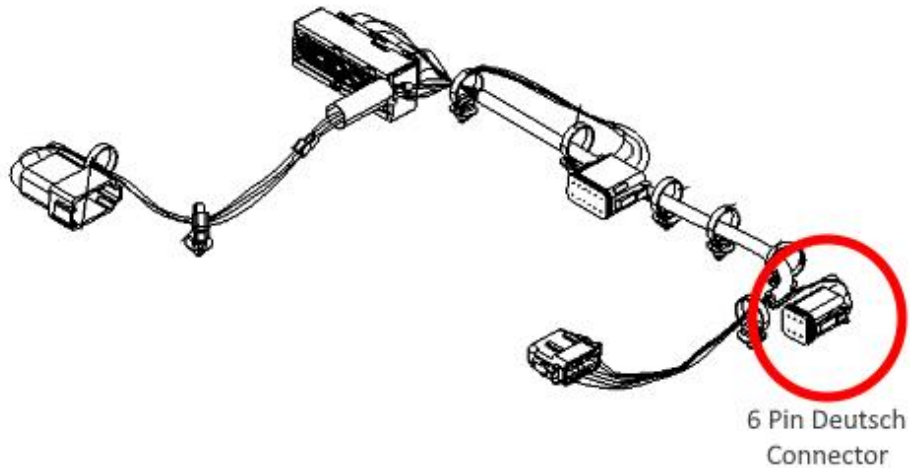
This cable comes with pre-installed labeled pins that you have to install into the existing connector as follows:



Make sure to check the alignment key on the bottom for the correct orientation of the plug.

### 1.2.4 Novatel/Trimble in AGCO Brand tractors (Fendt / MF / Valtra)

Agco tractors that have the wiring harness (Agco Partnr 72618438) installed, can be connected through the 6pin external modem connector in that harness.



## Section 3 : Setting up

### 3.1 Setting up BacomRTK

When the hardware is installed, **BEFORE turning the GPS reciever ON** , you have to make sure all the settings are entered. To do so, take your mobile phone and point the camera to the QR code that is **on the device**. There will also be stickers supplied to install in the cab for later easy access.



Example QR Code

You will see a URL , tap on the link and the settings page opens :



**NTRIP** Receiver Log

NTRIP Server  
Enter NTRIP server URL

Port  
Enter port (e.g., 2101)

Username  
Enter username

Password  
Enter password

Mountpoint  
NTRIP Mountpoint (case sensitive)

Save settings



**Be careful Username, Password and Mountpoint are case sensitive !**  
Select the 'Receiver' tab on top

**BacomRTK**  
Serial nr: 1Y8Z58RXBO v1.15

NTRIP **Receiver** Log

**Receiver:**  
Model:  
Topcon AGI-4

Port Settings:  
115200

NMEA Update frequency  
1s

**Base location:** Get Location  
Latitude:  
51.09812536747329  
Longitude:  
3.5136422608080444

Use BacomRTK as a base station

Save settings

**Model** : Select your Model

**Port Setting** : the port setting has to match the setting in the GPS receiver.

**NMEA update frequency** : This is the rate at which the GPS sends its location to the NTRIP server. Faster is more accurate (1s), but uses more data, slower (10s or 30s) can be less accurate , but is usually more then fast enough.

**Base station location** : This is used in cases where the GPS receiver is not able to send its location to the BacomRTK (sometimes this need to be configured in the GPS receiver, ask your dealer for more information) . Click the blue 'Get Location' button to get the location from the phone. It might ask you for permissions to share your location to this website. Then click the checkbox for 'Use BacomRTK as a base station'

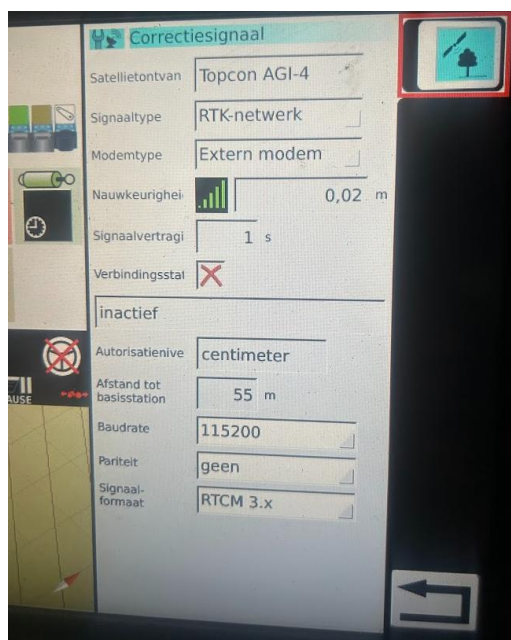


**When you need to use the base location as standard : the location needs to be in the same area as the fields you are going to work on. When you are using the BacomRTK within 10km (6 miles) range, the accuracy won't be affected. For each 10km further from the base location, accuracy drops by 1cm per 10 km. (0.4 inch per 6.2 miles). If you are going to work further away from the base location, open the settings page and click the 'Get location' button. And Save Settings. Close the hotspot of your phone for a few seconds, and reconnect it , or reboot the device .**

## 3.2 Connection settings

In your tractor your GPS needs to be configured to connect to the BacomRTK.  
Ask you dealer for more information.

In the RTK Settings, choose 'RTK Network', and 'External Modem'. Set baudrate to **115200**, no parity and **RCTM3.x** correction signal format.



Example settings in Fendt Varioterminale

## 3.3 Phone setup

One last step to do , is to make sure the device can automatically connect to the hotspot of your phone. Therefor the mobile hotspot password need to be set to '**BacomRTK**' (case sensitive!)

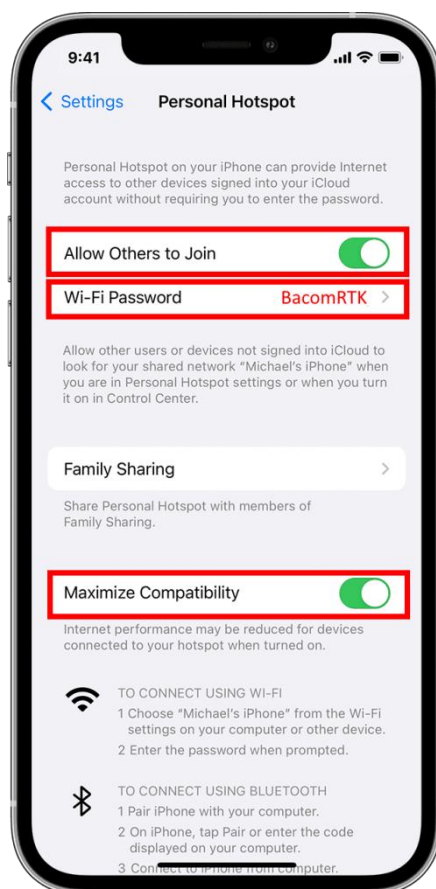


**When you are using the hotspot of your phone to stream data over WiFi to the BacomRTK device, it consumes above average energy , causing your battery to drain faster then usual. While you can easely use the BacomRTK for a few hours without any problem, it's adviced to keep your phone on a charger in the cab at all time.**



### 3.3.1 iPhone

go to **Settings > Personal Hotspot.**



Set the password to **BacomRTK**

Click the 'Allow others to Join', and click the 'Maximize Compatibility'

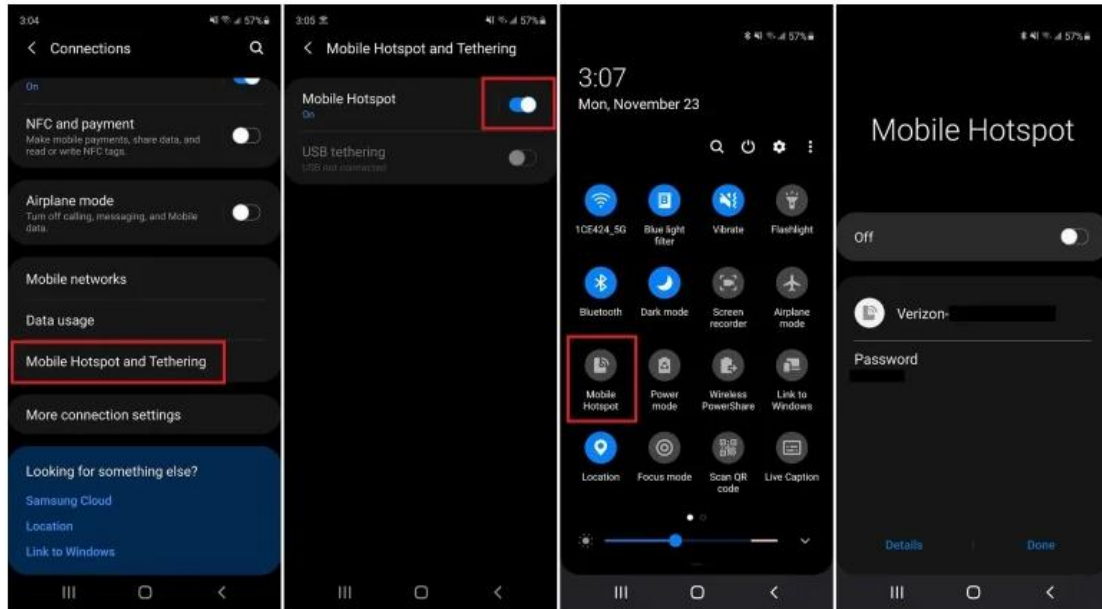


**Beware that you only put your hotspot active when you want to use the RTK signal, when you let your hotspot active all the time, the BacomRTK will automatically connect to it and start streaming data, which consumes power and drains your battery of your phone. On iPhones you can quickly turn your hotspot on or off by saying 'Hi Siri, activate my hotspot' or 'Hey Siri, stop my hotspot'.**

**When the hotspot is active, the time display in the left top corner will turn green, like **10:12****

### 3.3.1 Android

How you access hotspots on Android devices will depend on which phone you have and what version of Android you're running. You can generally open the pull-down shade and turn on your mobile hotspot from there or find it buried in settings. Where exactly and what it's called will differ depending on your phone's manufacturer.



Example : Mobile hotspot on a Samsung phone running Android 10

Make sure the hotspots password is set to **BacomRTK**

Make sure to click the '**Maximize Compatibility**'

To find out if the hotspot is active, swipe down from the top of the screen and find the '**Hotspot**' icon. When BacomRTK is connected, it should say '**1 device connected**'

## **Section 4 : Using the device**

Whenever you need to have RTK corrections , the only thing you need to do is to activate the hotspot of your phone. The device will automatically connect to it and start streaming .

It's best only to do this when you are on the field, that way your correction data will be matched best with your location.

## Section 5 : Troubleshooting

**Q :** My hotspot does not get active, the device won't connect.

**A :** The BacomRTK searches for the strongest WiFi network in the area, and tries to connect to it. Make sure no other (stronger) WiFi networks in your direct area are active, like other phones with their hotspot active, or local WiFi networks in the house. Check that your WiFi has 'BacomRTK' as password.

**Q :** The device is connected , but i can't get an RTK Fix

**A :**

- Is the GPS correctly configured to use an external modem?
- Is the baudrate set to 115200,N (can also be changed in the settings of the BacomRTK)
- Check the log files on the settings page for any information.
- Is your subscription to the NTRIP caster still valid?
- If nothing works, get in contact, we can help .

**Q :** The connection drops

**A :** This can happen in areas where 4G or 5G signal is too weak. If possible, set your network connection on your phone fixed to 4G in those cases.. 5G has different bands, low band (wide coverage, slower speed) , mid band (balanced between speed and range) and high speed (fast speed , low range) .

**Q :** I sometimes can't directly connect to my NTRIP Server.

**A :** Most NTRIP server are secured against abuse, so if the device needs more then one login attempt it could be because of bad reception and too much login attempts . Power down the receiver and wait a minute before rebooting.

## Section 5 : Technical data

### Technical data

Power supply	10-24V DC, 500ma max
Wi-Fi	Integrated 802.11b/g/n(2,4 Ghz) , range at least 10m (33ft) WPA2 security
Measurements	133 x 118 x 36mm ( 5.23 x 4.65 x 1.42")
Mounting holes separation	101.6mm (4")
Degree of protection	IP67
Operating temperature	-40°C to +85°C (-40°F to +185 °F)
Serial port	RS232 , default baudrate 115200 (adjustable)

### Mobile phone requirements

iPhone	iOs 16 (or higher) Model XR (or higher)
iPad	iOs 16 or higher Model 3 <sup>rd</sup> generation with cellular (or higher) Model Mini 1 with cellular (or higher) Model Air 1 with cellular (or higher) iPad Pro with cellular
Android	Alle devices with hotspot capability Android version 4.0 (or higher)