BeanAir
WIRELESS IOT SENSORS

QUICK START

BeanGateway® 2.4GHz

BeanGateway® 2.4GHz

With 3G / 4G / LTE / Connectivity

For 2.4GHz Sensors

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1. TECHNICAL SUPPORT

For general contact, technical support, to report documentation errors and to order manuals, contact BeanAir® Technical Support Center (BTSC) at:
tech-support@beanair.com

For detailed information about where you can buy the BeanAir® equipment/software or for recommendations on accessories and components visit:
www.beanair.com

To register for product news and announcements or for product questions contact BeanAir's Technical Support Center (BTSC).

Our aim is to make this user manual as helpful as possible. Please keep us informed of your comments and suggestions for improvements. BeanAir® appreciates feedback from

2. VISUAL SYMBOLS DEFINITION

Symbols	Definition
	Caution or Warning – Alerts the user with important information about BeanAir® wireless IOT Sensors. if this information is not followed, the equipment /software may fail or malfunction
	Danger – This information MUST be followed if not you may damage the equipment permanently or bodily injury may occur.
	Tip or Information – Provides advice and suggestions that may be useful when installing BeanAir Wireless IOT Sensors.

3. ACRONYMS AND ABREVIATIONS

AES	Advanced Encryption Standard
CCA	Clear Channel Assessment
CSMA/CA	Carrier Sense Multiple Access/Collision Avoidance
GTS	Guaranteed Time-Slot
kSps	Kilo samples per second
LDCDA	Low duty cycle data acquisition
LLC	Logical Link Control
LQI	Link quality indicator
MAC	Media Access Control
PER	Packet error rate
POE	Power Over Ethernet
RF	Radio Frequency
SD	Secure Digital
UPS	Uninterruptible power supply
USB OTG	USB On The Go
WDAQ	Wireless DAQ
WSN	Wireless Sensor Networks

4. QUICK PRODUCT DESCRIPTION

4.1 UNBOX YOUR BEANGATEWAY® 2.4GHZ 4G

Open your BeanGateway® Box
The 2.4GHz 4G Gateway is available in two versions:

• BGTW-4G-MPWR-OUT, Mains Power supply

• BGTW-4G-SOLAR-OUT, Solar Power Supply

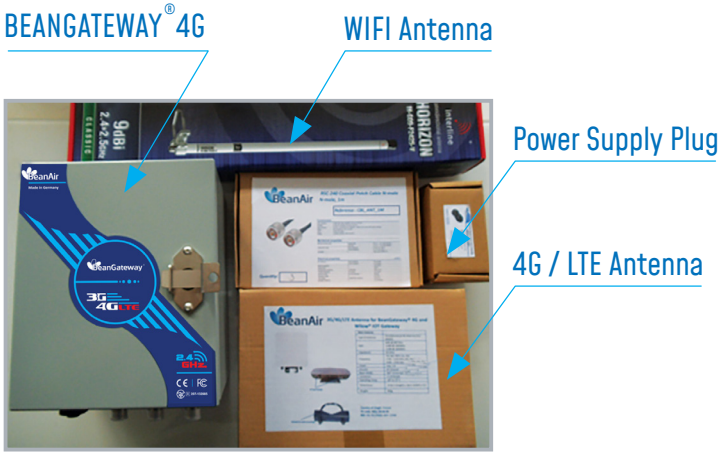
It is provided with a 4G antenna, WiFi antenna, external cables for both WiFi & 4G/LTE antennas and a power supply plug (only available with the mains power version).

4.2 ACCESSORIES DESCRIPTION

In addition to the BeanGateway® you will find inside the packet a list of accessories:

- 4G Antenna
- WiFi Antenna
- External cable for Wifi antenna
- External cable for 4G/LTE antenna
- Power supply plug (only available with the mains power version)

4.2 ACCESSORIES DESCRIPTION



For more info on the accessories and its specification please refer to the user manual

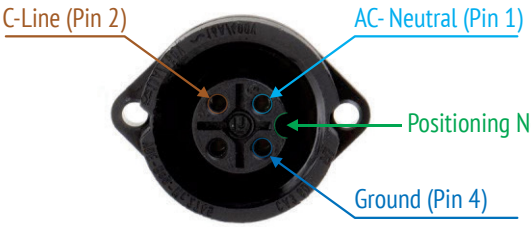
5. INSTALLATION

1 : Please follow the following wiring code instructions to correctly build your own AC Power supply

• MAINS POWER SUPPLY (REF: BGTW-4G-MPWR-OUT)

The previous hardware version comes with a Female Socket and a Male Plug

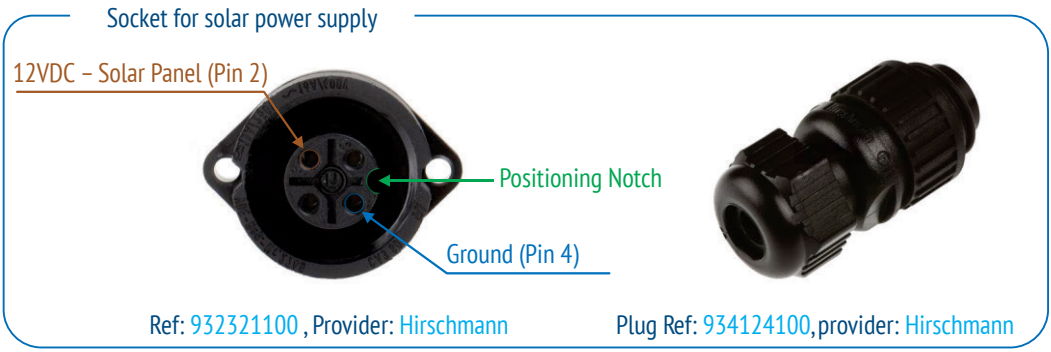
Socket for Mains Power supply



Ref: 932321100 , Provider: Hirschmann

Plug Ref: 934124100, provider: Hirschmann

• SOLAR POWER SUPPLY (REF: BGTW-4G-SOLAR-OUT)

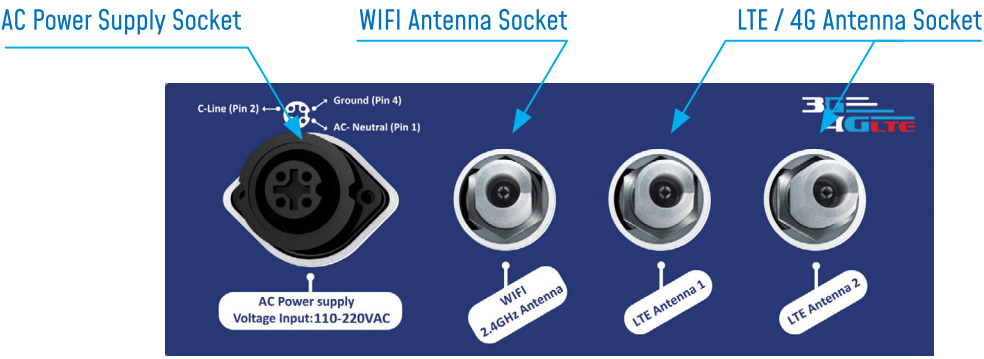


DC Power:

The solar power controller can work between 13VDC to 20VDC, user can use an AC/DC power adapter in this voltage rating.

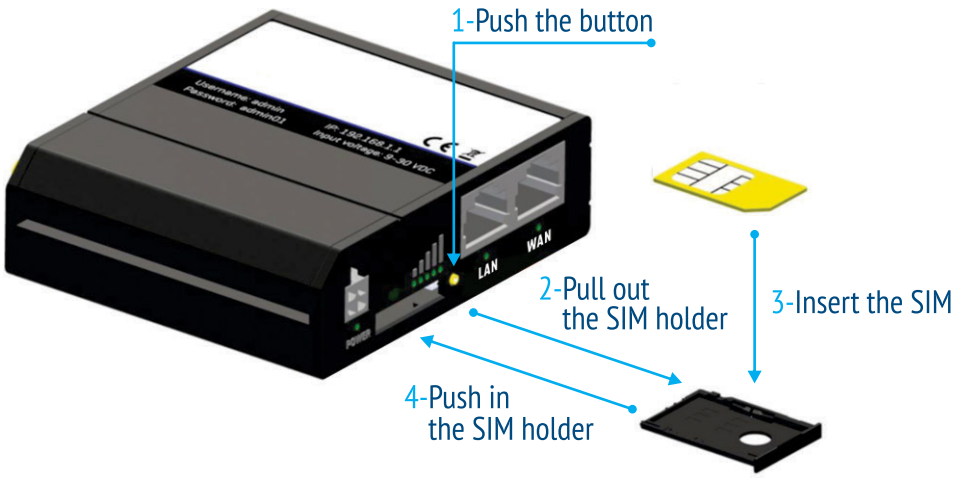
If the DC Voltage is less than 13VDC, the provided voltage will not be enough to power the Solar Power Manager

2: Use the provided antennas cables and power supply cable to connect to the appropriate connectors as shown below in the figure.



3. Open the box enclosure and use the Ethernet cable to connect your Laptop to the router in order to configure the IoT Gateway and get it ready for remote monitoring, as well to insert SIM card. Use a screwdriver to remove the black lid and properly insert the SIM card.

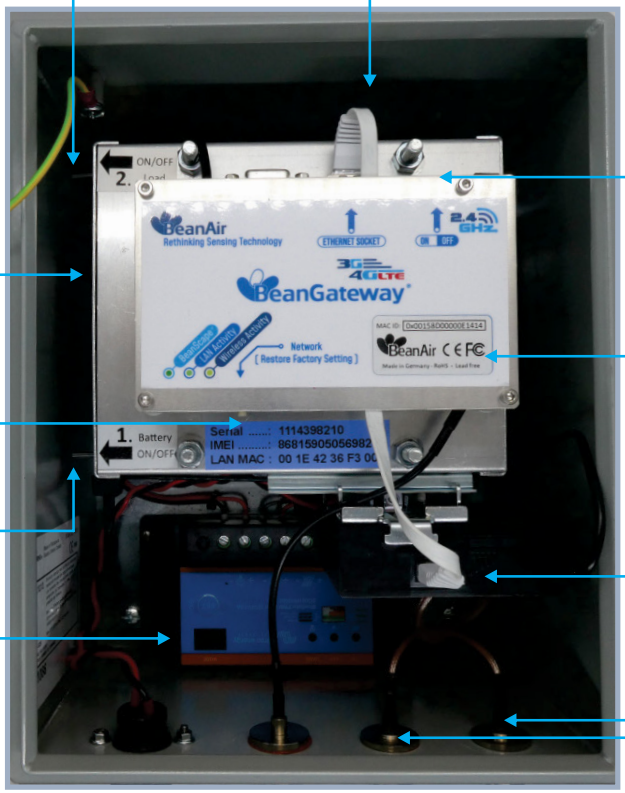
SIM CARD INSERTION



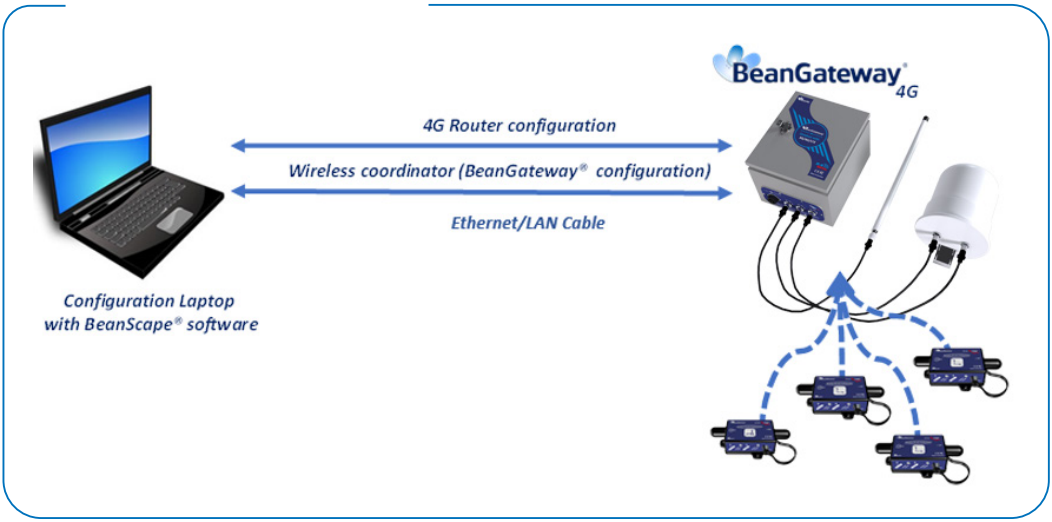
4. Don't forget to turn On the switch mode box by pushing the ON/OFF push buton at the top left corner, in order to charge the Lead-Acid Battery and get the gateway ready for configuration.

BGTW-4G-MPWR-OUT, MAINS POWER SUPPLY

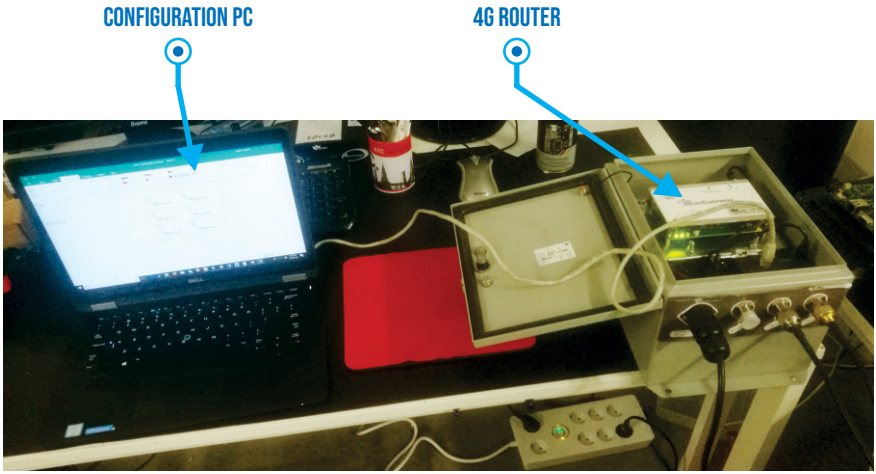
BGTW-4G-SOLAR-OUT, SOLAR POWER SUP-



4. Use an ethernet cable to connect the router inside the IOT Gateway® to your laptop.



• Plug the power adapter to your 4G Router, then use an ethernet cable and plug it into the LAN Ethernet port of your Configuration PC.

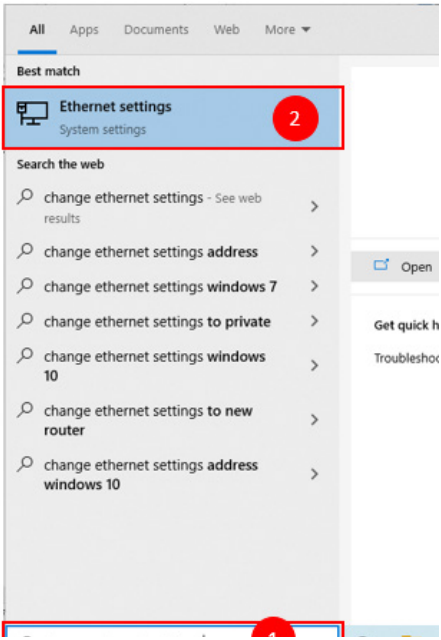


6. DEFAULT SETTINGS

THE DEFAULT 4G GATEWAY® IP ADDRESS IS 192.168.1.1

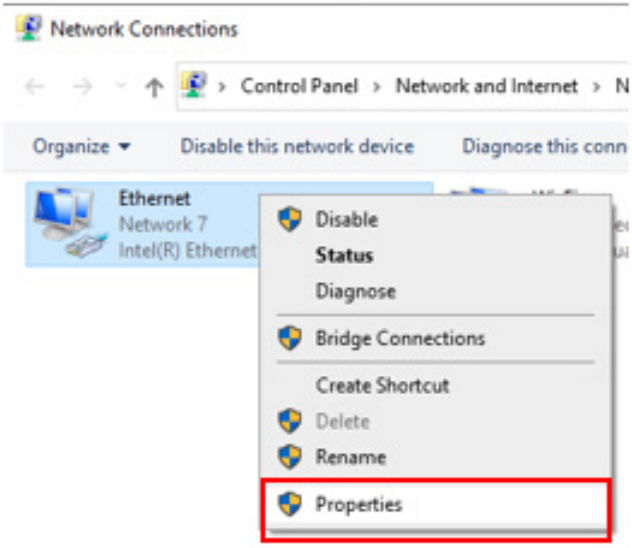
1. Assign a static IP address to your PC within the same subnetwork as your BeanGateway®

• In the search bar tap change ethernet settings, then click on open

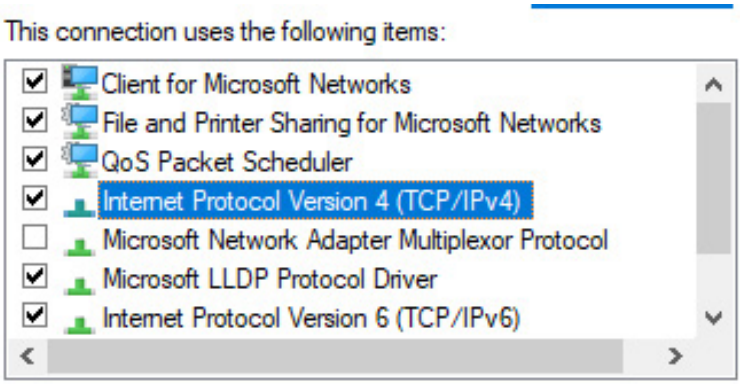


• Click on change Adapter settings

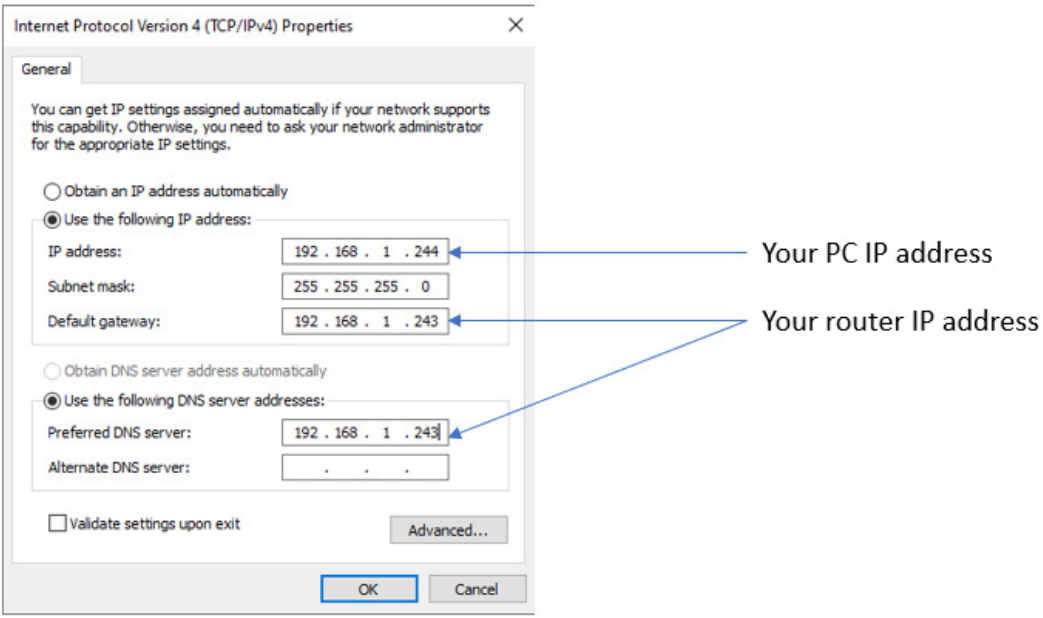
- Right click on the Etherner device with is connected to your IOT Gateway, choose Propreties



- Double click on Internet Protocol Version4 (TCP/IPv4)

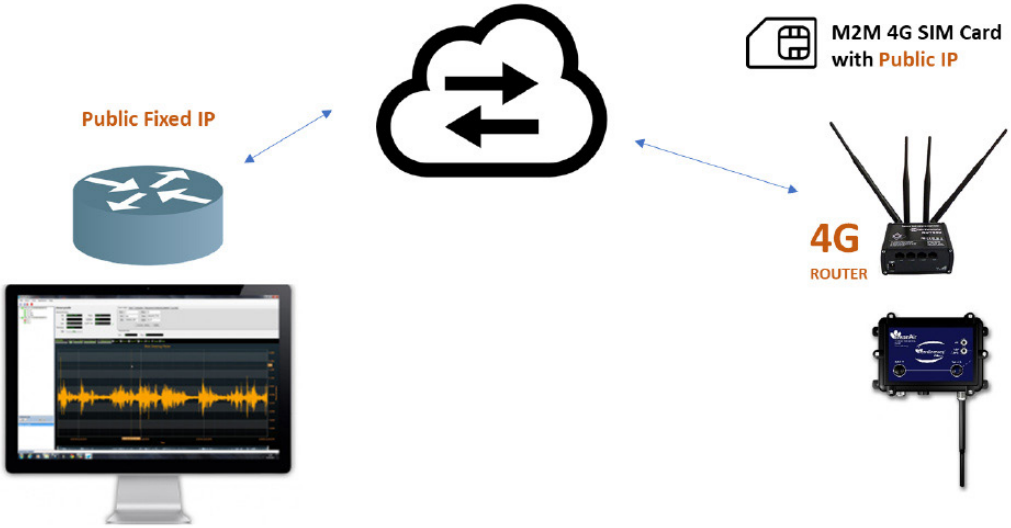


- Enter the flowing settings:
  - Enter any ip in the form of 192.168.1.XXX where XXX is a number from 2 to 254 (except 243 which is the router IP address).
  - Enter **255.255.255.0** for your subnet mask
  - The default 4G gateway must come with the same IP address that your 4G Router **192.168.1.243**
  - Finally enter primary DNS server IP , the same than your 4G Router IP **192.168.1.243**
  - Click on OK validate your configuration



- Once your PC and IOT Gaetway® are connected to the same network, you can easily have access to the router.

7. HOW TO SETUP A REMOTE ACCESS IN 4 STEPS (EXAMPLE OF IP FORWARDING METHOD)



Before to start to configure your remote access, make sure your Office router/ASDL Box should come with Fixed Public IP address to avoid losing the BeanGateway® whenever it reboots for any reason.

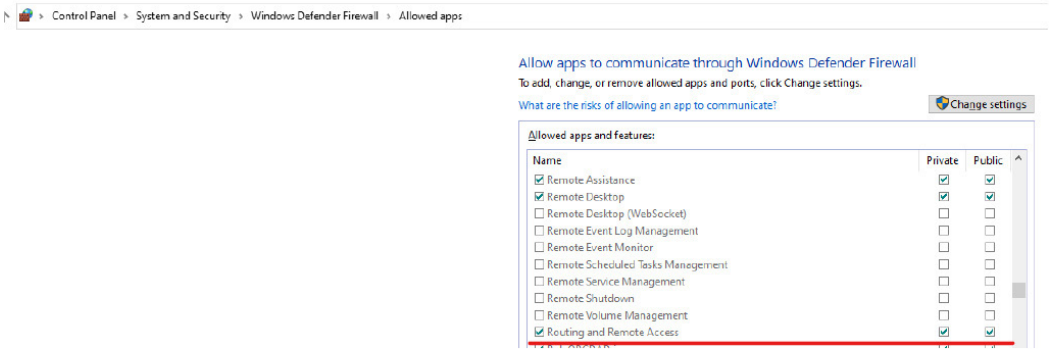
How to get a fixed public IP:

- If you are using an ADSL Router at your office: you can ask to your ADSL Router provider to allocate you a fixed public IP
- You can purchase a Data SIM card with fixed public IP from your ISP (Example: Olivia Wireless)
- If you are using a standard SIM card, some PORTS can be blocked by the ISP.

It's not mandatory to use a SIM card with fixed public IP on the monitoring site.

7.1 STEP 1: AT YOUR OFFICE, CONFIGURE YOUR FIREWALL FOR REMOTE ACCESS

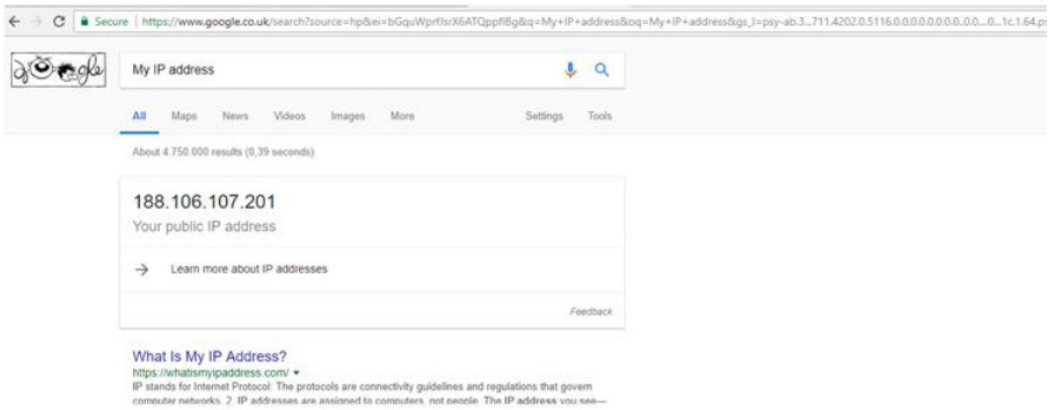
You have to enable Routing and Remote Access option for both Private and Public networks, communication through the firewall.



7.2 STEP 2: AT YOUR OFFICE, CONFIGURE IP FORWARDING RULES

7.2.1 Example with ADSL MODEM (NAT ROUTER Configuration)

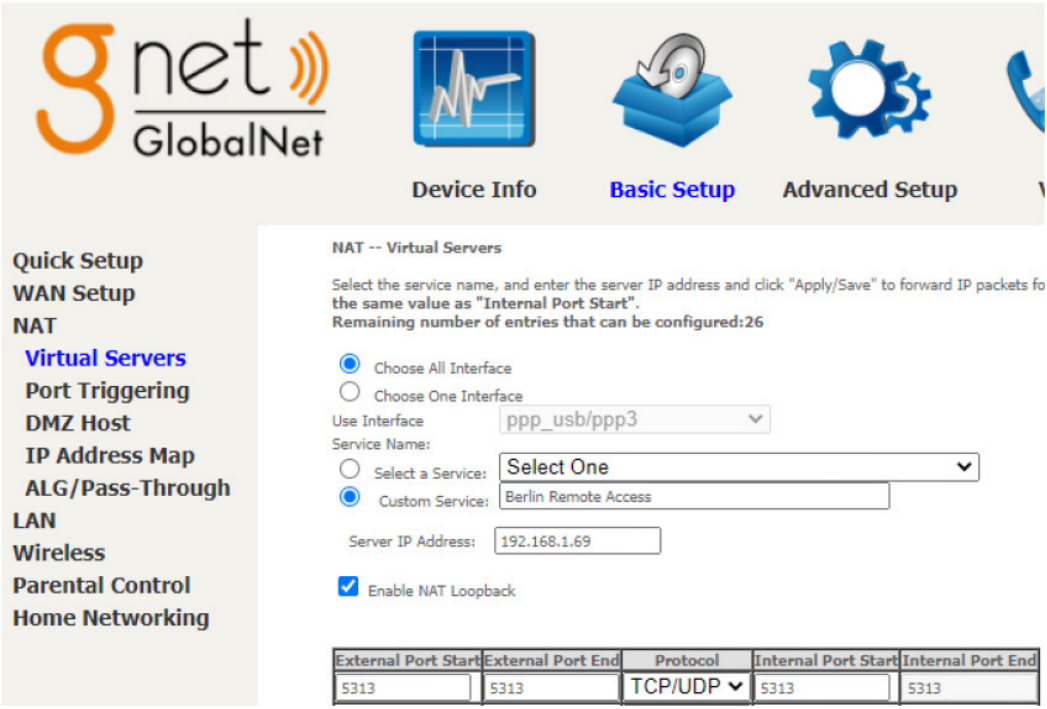
1• From your Office PC, search for your Public IP address (ex: search for MyIP on Google).



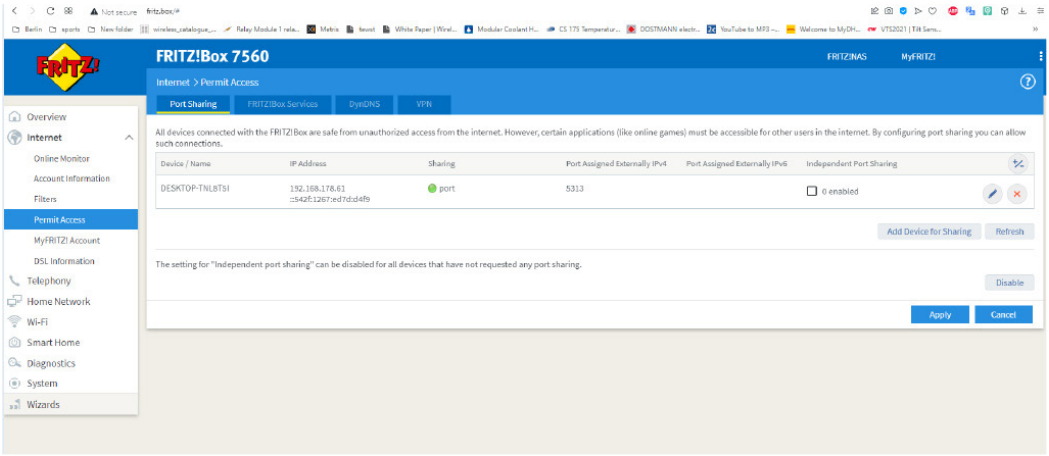
Make sure that no antivirus/firewall is blocking the network activity between the BeanGateway® and the BeanScape® software.

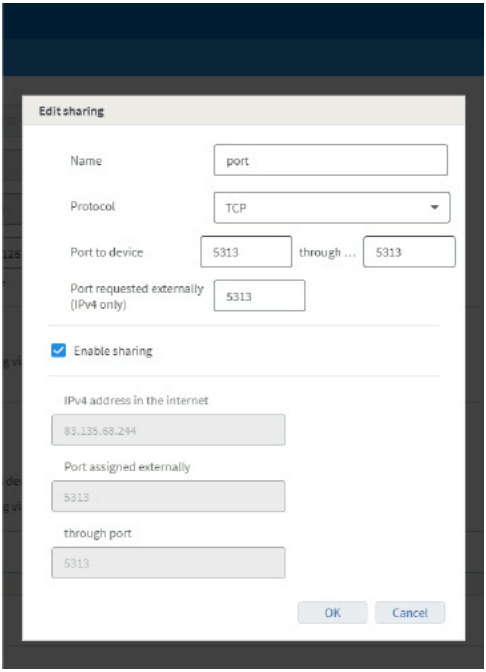
2• Setup a Port Forwarding configuration on your Router (each router brand has its own configuration interface).

Example 1: GlobalNet ADSL Router Webserver configuration (North Africa)



Example 2: Fritze Box (Germany)





Please be aware if the public IP Address of your ADSL Box is not fixed, you will lose the connection between the Bean-Gateway® and your Monitoring PC (at the office), whenever the router reboots. If you are not sure to have a fixed public IP, we suggest you use a 4G Router and a SIM Card with a fixed public IP.

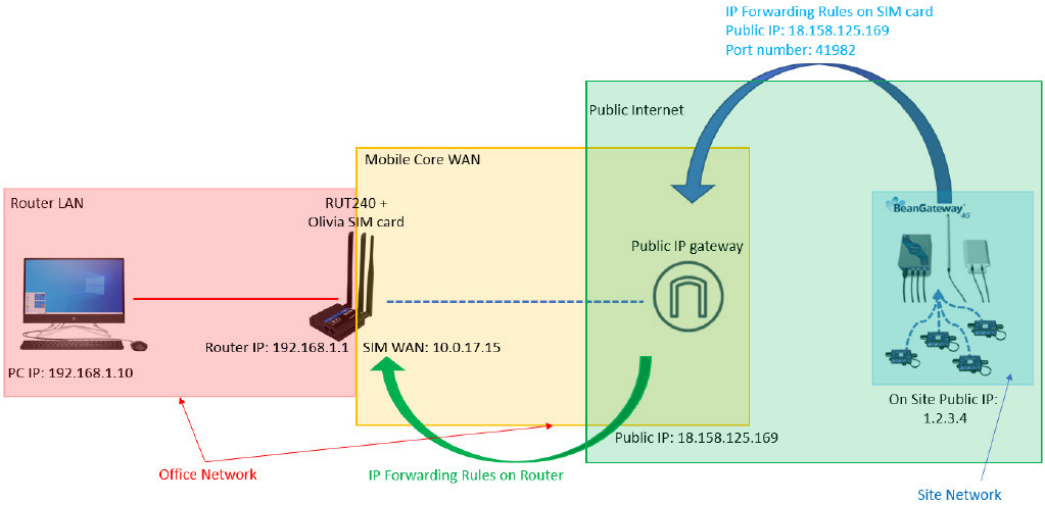
7.2.2 Example of 4G Router (SIM CARD Provider Olivia wireless)

if you have a 4G router with a SIM card at your office, make sure that the SIM card comes with a Fixed Public IP address and your ISP provider doesn't restrict any port numbers.

In this example we will work with Olivia Wireless SIM card which comes with a Fixed public IP address.

7.2.2.1 System Architecture

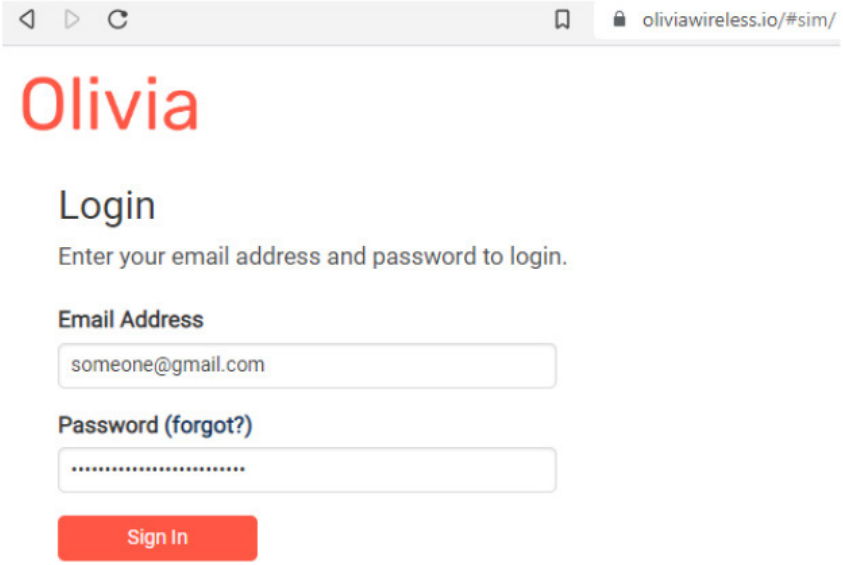
Olivia is using a Public Gateway in its system architecture, in order to allow users on the internet to reach the SIM directly.
The Public Gateway is simply a port forward service that's why you have to create a port forwarding rules on both SIM Card platform and also on your office router.



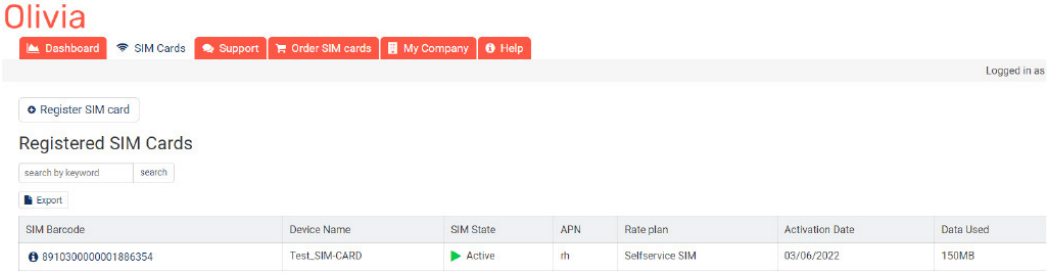
Please follow these steps to correctly configure the system.

- Step 1: Verify that Public IP routes service is enabled on your SIM card interface.

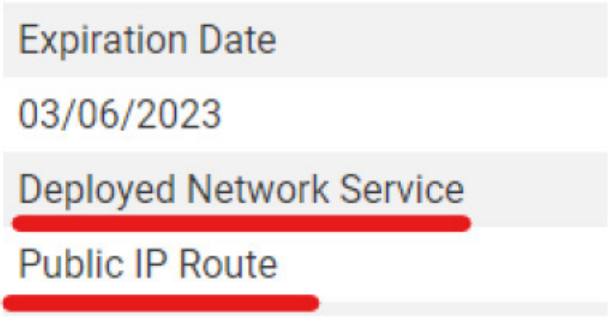
  - We assume that you have already purchased the Fixed public IP service when you set up the payment method.
  To verify that the Fixed Public IP address service is enabled, please login to your SIM Card platform



  - Then go to the tab SIM Cards.



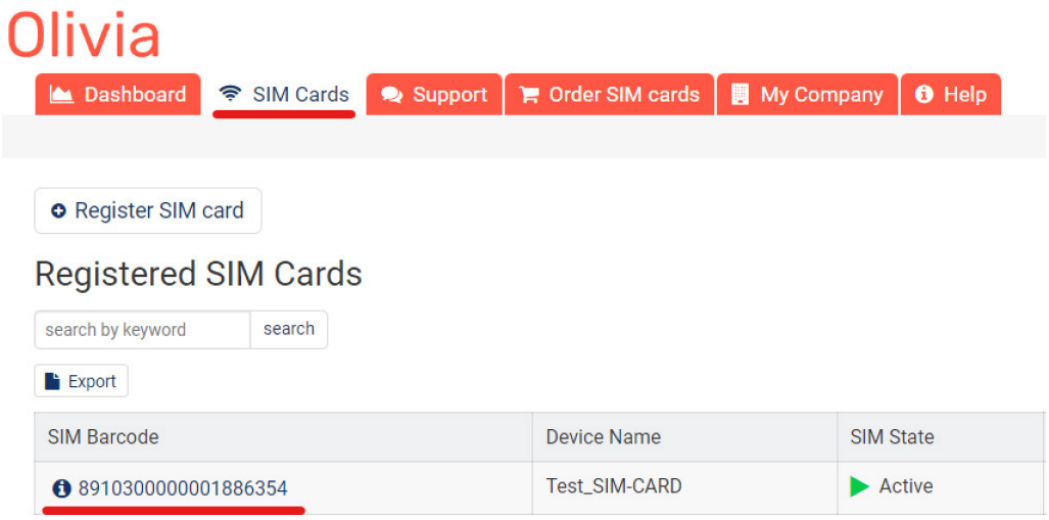
- You should see “Public IP Route” noted under “Deployed Network Service” on the SIM cards details page.



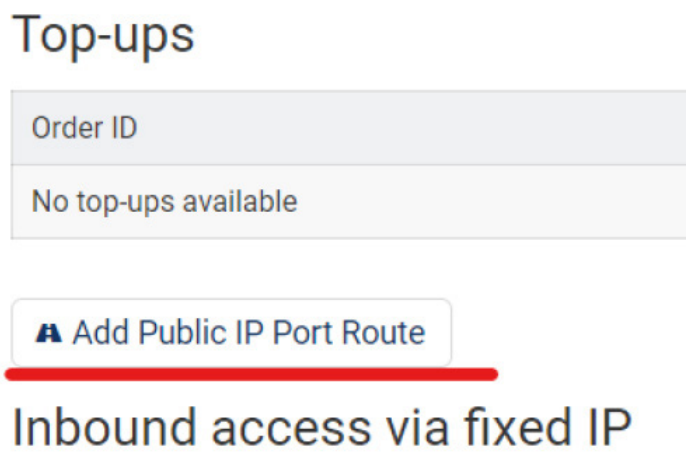
  - If it’s not the case you have to enable it before proceeding.

- Step 2: Setup Port Forwarding on the Public IP Gateway (SIM Card)

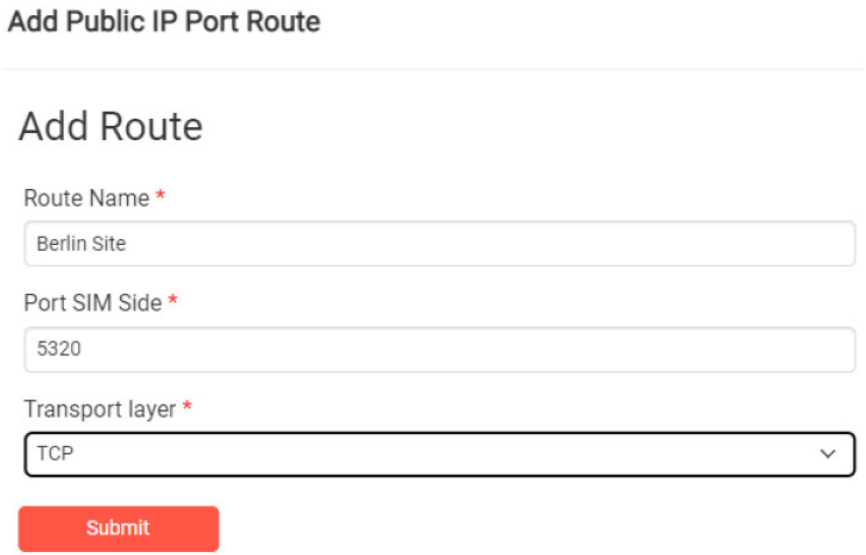
  - Navigate to “SIM card” and click on the SIM barcode



- Then click on ADD Public IP Route



- Give your route a recognizable name, Enter the port you would like to reach on the SIM/ Router then select the protocol (usually TCP) and click 'Submit'.
- Create the PORT ID of your SIM card (avoid ports 22, 80 and 443)



- A random port on the gateway will now be locked to be used with your SIM card

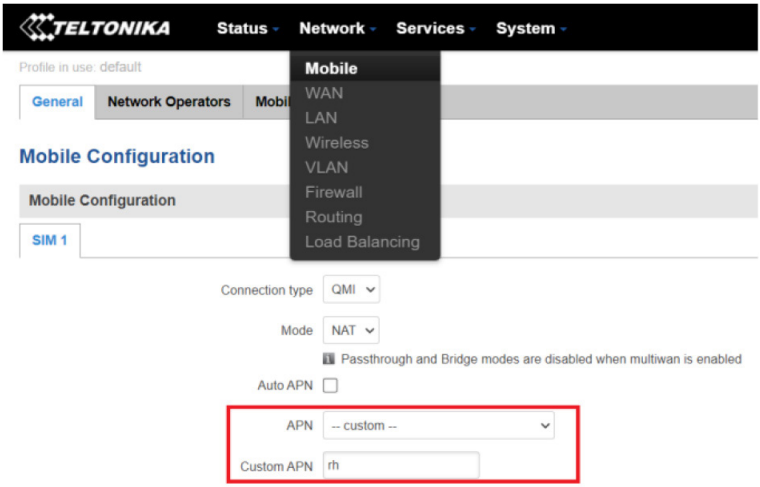
Routes Name	SIM IP	Port SIM Side	Public IP:Port	Delete
Berlin Site	10.0.17.15	5320	18.158.125.169:41988	

IMPORTANT :
• The PORT ID of your SIM card will be used to create the IP Forwarding rules on your LTE Router running at the office.
• Note the Public IP and the PORT number, it will be used during your BeanGateway® configuration on your monitoring site.

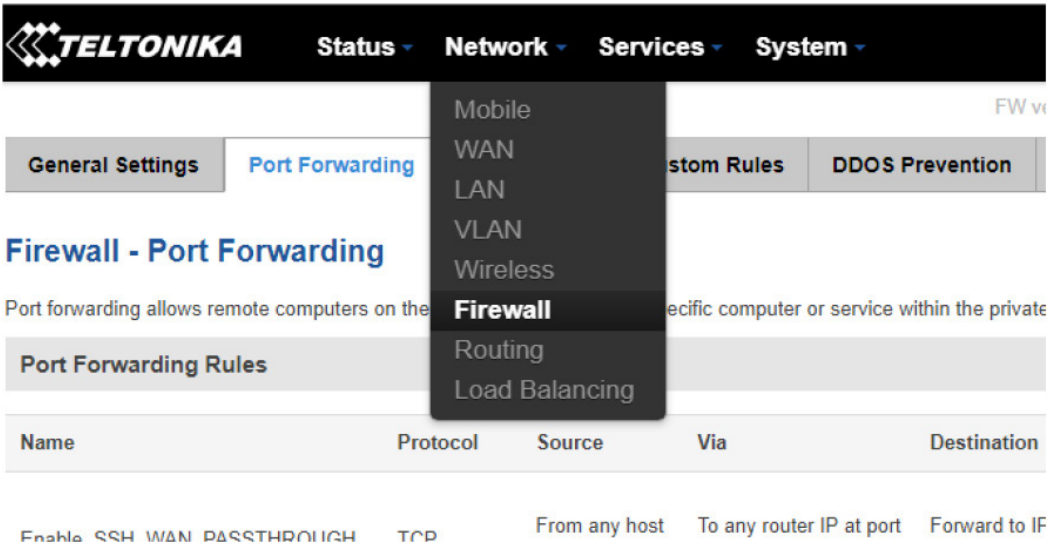
- Step 3: Install the SIM Card on the router and Configure the Mobile Network

In this example we are using Teltonika Router RUT240, but the steps are similar for different types of routers.
Insert the SIM Card into your Router then use the corresponding User Name and Password to log in.
Then Navigate to Network --> Mobile, then Enter the following configuration
- APN: --custom–
- Custom APN: rh

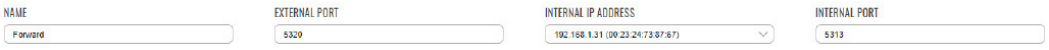
And Keep all the other settings on default then click on save.



- Step 4: Install the SIM Card on the router and Configure the Mobile Network
    - Login to your router, then navigate to Network --> Firewall --> Port Forward



Scroll down to New Port Forward Rule and set the following
- Name: Any recognizable name
- Protocol: TCP+UDP
- External port (s): SIM Card PORT ID in our case 5320 (avoid ports 22, 80 and 443)
- Internal IP: Select the IP of your PC
- Internal port (s): Any port on which you want to access (Port used on BeanScape software) 5313

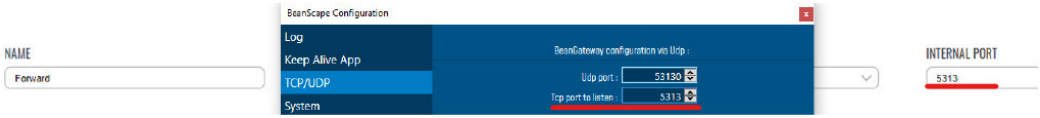


Make sure that the port forwarding rule is configured from WAN: External Port (or Source Zone) to LAN: Internal Port.


TELTONIKA
Status
Network
Services
System
Logout
Profile in use: default
FW ver.: RUT2XX_R_00.01.13.1
General Settings
Port Forwarding
Traffic Rules
Custom Rules
DDOS Prevention
Port Scan Prevention
Helpers
Firewall - Port Forwards - Forward
This page allows you to change advanced properties of the port forwarding entry. Although, in most cases there is no need to modify those settings.
Enable
Name
Forward
Protocol
TCP+UDP
Source zone
gre: gre tunnel:
hotspot:
l2tp: l2tp:
lan: lan:
pptp: pptp:
sstp:
vpn: openvpn:
wan: wan: ppp: tun: (empty) wan2:
Source MAC address
any
Source IP address
any
Source port
any
l2tp: l2tp:
lan: lan:
pptp: pptp:
sstp:
vpn: openvpn:
wan: wan: ppp: tun: (empty) wan2:
Internal IP address
192.168.1. 31
Internal port
5313
Enable NAT loopback
Extra arguments
Back to Overview
Save

7.3 STEP 3: AT YOUR OFFICE, CONFIGURE THE PORT NUMBER ON YOUR BEANSCAPE®

On your office PC don't forget to put the BeanScape TCP port number the same as the internal Port TCP number chosen in the router port forwarding configuration rule.



If you change the default TCP port on BeanScape software to another port number different than 5313, you have to restart the server to establish the connection with the monitoring site.

7.4 STEP 4: BEANGATEWAY® CONFIGURATION ON THE MONITORING SITE

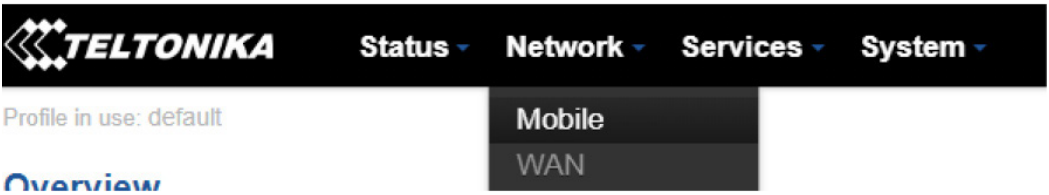
Now that you have your Public Fixed IP of your BeanScape® software running at your office. You can start to configure your BeanGateway® and LTE Router running on the monitoring site.

7.4.1 Sim card configuration

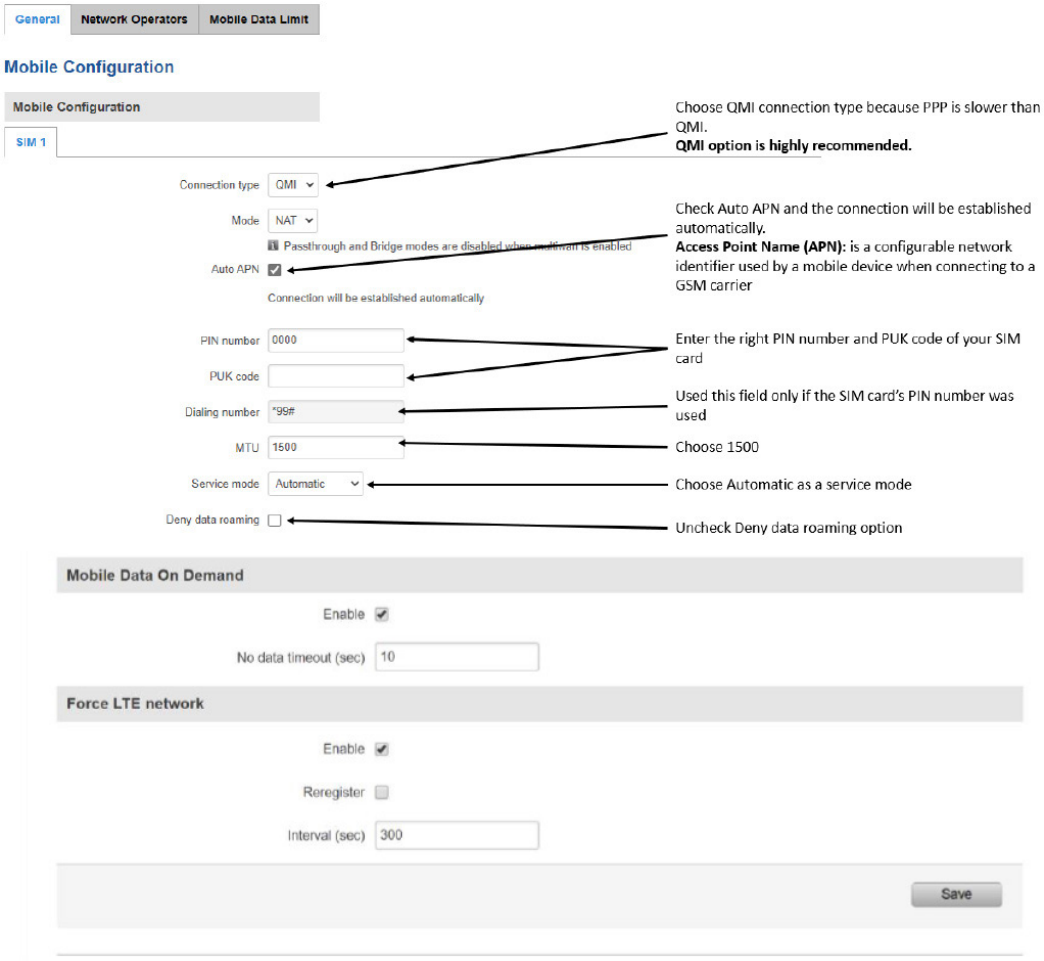
Use your browser on your PC and log in to the router using the following settings:

- IP address: 192.168.1.243 (tap it in google search bar)
- Username: admin | password: Beanair2020!

To configure your 4G/LTE Router go on Network then Click on Mobile



- Now configure your mobile settings as follow

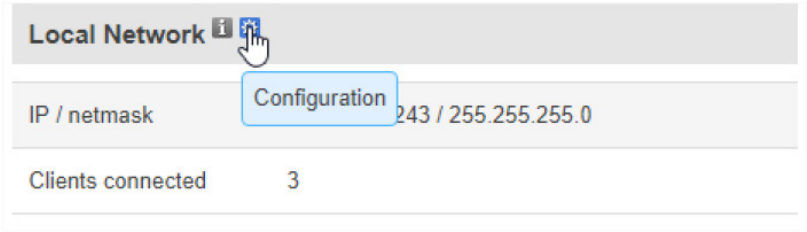


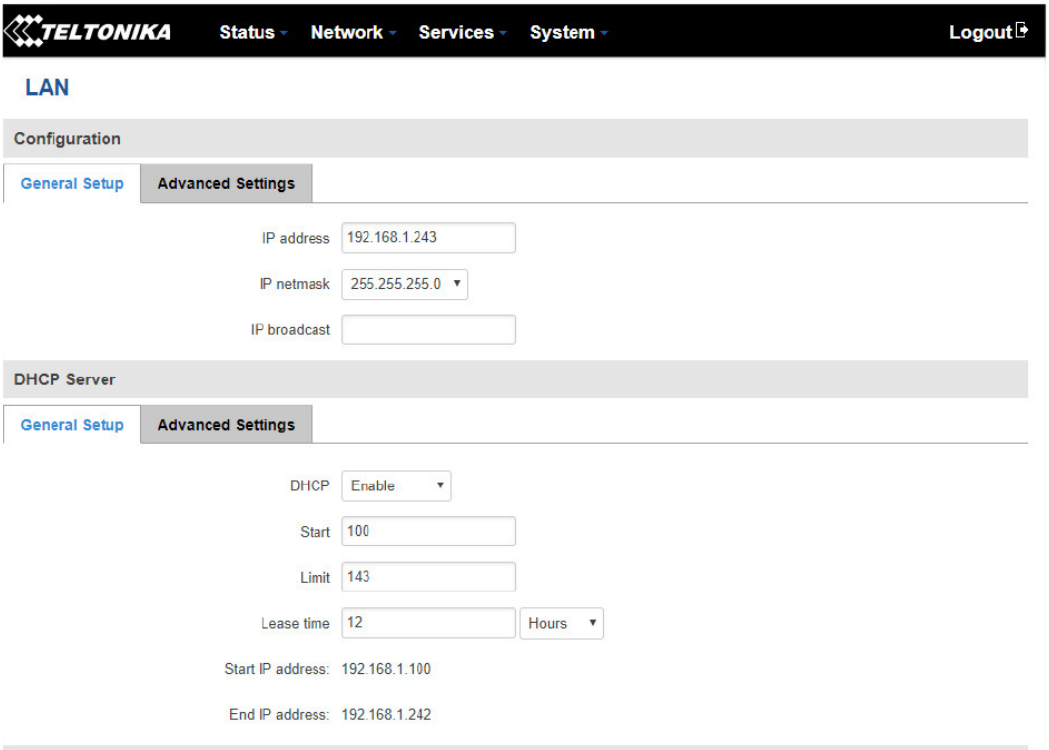
You can get the APN ID from your telecom operator provider

If an invalid PIN number was entered (i.e. the entered PIN does not match the one that was used to protect the SIM card), your SIM card will get blocked. To avoid such mishaps, it is highly advised to use an unprotected SIM. If you happen to insert a protected SIM and the PIN number is incorrect, your card won't get blocked immediately, although after a couple of reboots OR configuration saves it will.

7.4.2 Make sure the DHCP is enabled on your LTE router

LAN IP address should be 192.168.1.243 by default and if this is not the case for whatever reason ,you will need to set it back to 192.168.1.243 in the configuration panel you can find in the overview page

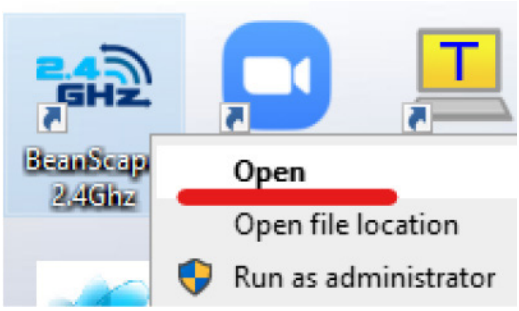




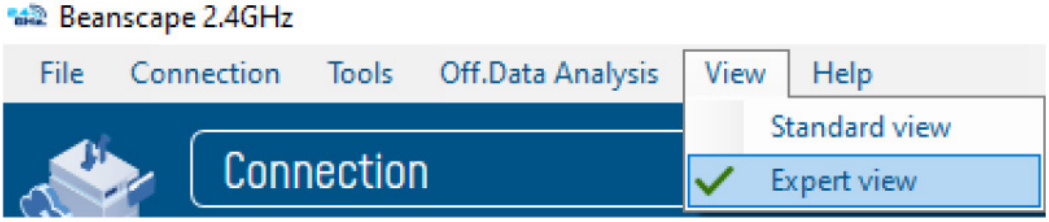
7.4.3 BeanGateway® 2.4GHz configuration with Public IP of your Office PC

Now that your LTE Router is configured with your SIM card, it's time to configure correctly your BeanGateway® 2.4GHz
Right after connecting your BeanGateway® 2.4GHz to your PC via the LAN cable,

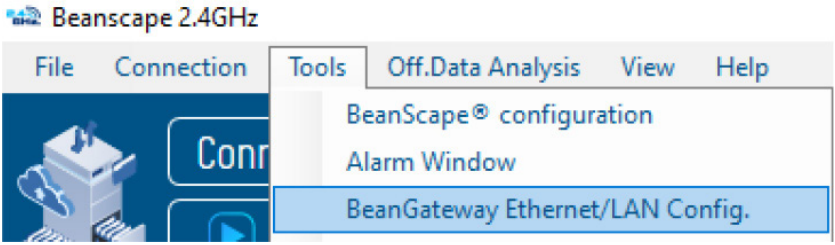
1. Right click on your BeanScape® software icon then click on Open



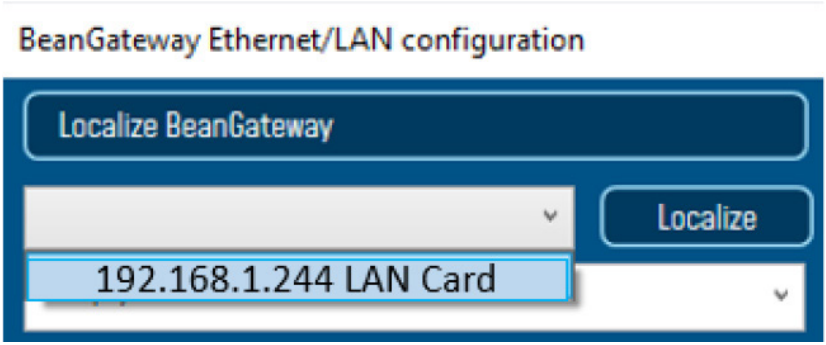
2. Switch to Expert view



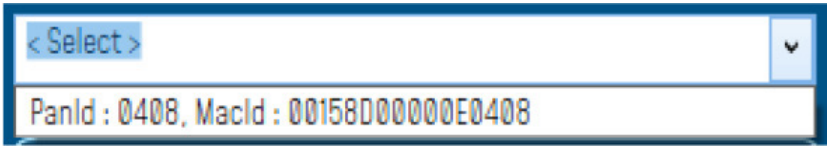
3. Navigate to Tools --> BeanGateway Ethernet/LAN config



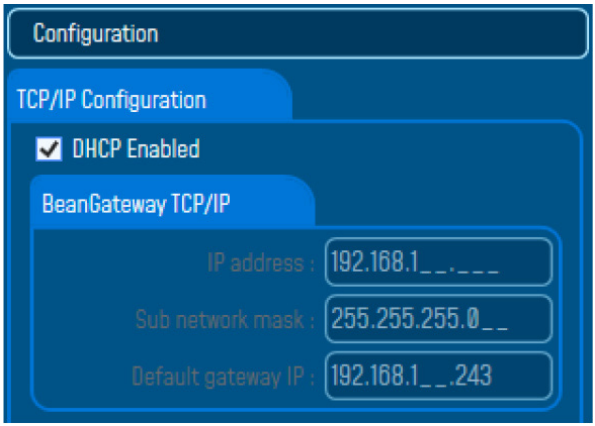
4. Select your LAN card IP Address (192.168.1.244), then click on Localize



5. After Localization process, select your 4G BeanGateway® MAC ID



6. Check DHCP option to assign an automatic IP address to your BeanGateway®, then click on validate

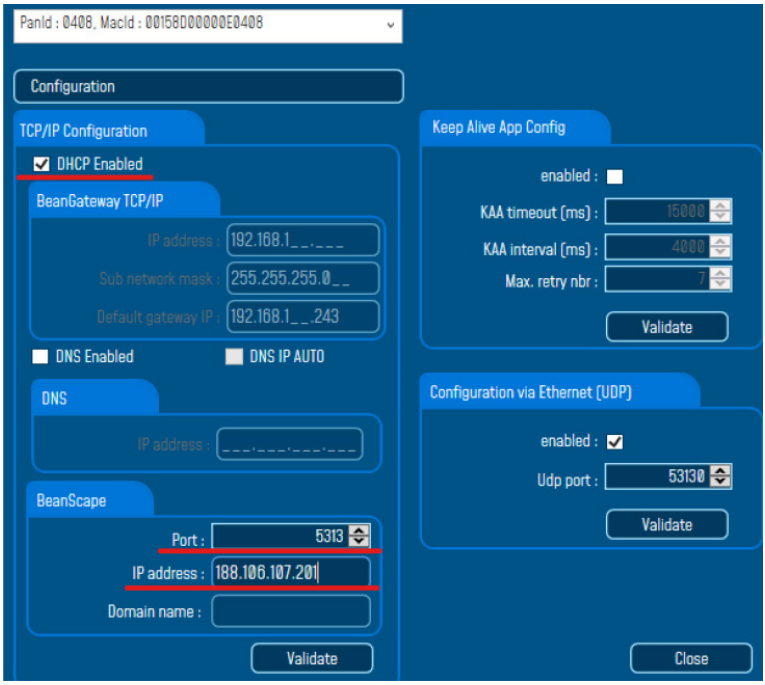


7. On BeanScape® frame:

• Case 1 - If you are using a ADSL Router at your office

Make sure to allocate the Public IP of the PC Hosting Beanscape software (you will get your Public IP from step 2)

- In this case the Public IP is 188.106.107.201

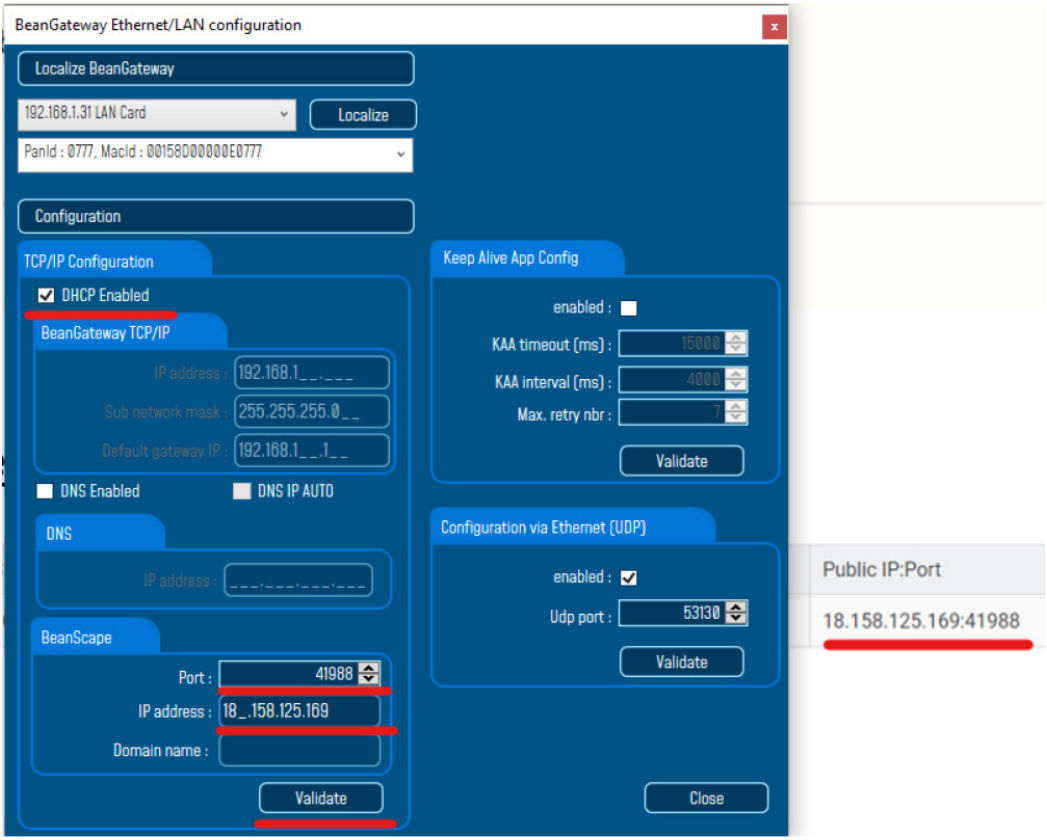


• Case 2 - If you are using a LTE Router with a Data SIM CARD (example of Olivia Wireless SIM CARD)

To forward data communication of your BeanGateway® to your Office PC, enter the Fixed Public IP address which was created on the SIM Card before and its corresponding TCP Port number.

Example of IP forwarding Rules created on the Router

Routes Name	SIM IP	Port SIM Side	Public IP:Port	Delete
Berlin Site	10.0.17.15	5320	18.158.125.169:41988	



Make sure to use the Fixed Public IP address and the TCP Port number which are created on the SIM Card rule.
Do Not use Google to search for your Public IP address, it will give you the IP address of the roaming ISP provider and the remote configuration will not work.

8. WHERE TO FIND MORE TECHNICAL INFORMATION ?

For more technical litterature, please visit our White Paper Page:

Please refer to the BeanDevice® 2.4GHz EcoSensors user manual section for more information
https://www.wireless-iot.beanair.com/files/UM-RF-03-ENG-EcoSensor-Wireless-Sensors-for-En-

For detailed information on the available Data Acquisition mode ,please refer to our technical note
http://www.wireless-iot.beanair.com/files/TN-RF-008-Data-acquisition-modes-available-on-the-BeanDevice.pdf

Facing technical problems ?
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