

Guidelines for Aranet PRO base station connection to WIFI network for remote access

Before You do steps written below please have in Your possession a spare Ethernet cable with You in case the WIFI configuration is not successful You need to be able to access Aranet PRO base station with Ethernet cable and make corrections.



First Aranet PRO base station should be connected in local WIFI network following instructions given below:

- 1) Determine Your local WIFI network configuration. Here You have to connect a laptop to the local WIFI network You plant to use also for Aranet PRO base station. When connected to local WIFI network on the laptop You have to open **Command Prompt** interface of Windows. In **Command Prompt** interface run command **ipconfig /all** and find line where Wi-Fi information about *IPv4 Address, Subnet Mask, Default Gateway* and *DNS Servers* is shown. Save or write down somewhere this information:

The screenshot shows a Windows search interface on the left with 'Command Prompt' selected. A red box labeled '3' is around the search result, and another red box labeled '2' is around the 'cmd' search bar. A red arrow points from the search bar to the Command Prompt window on the right. The Command Prompt window shows the command 'ipconfig /all' entered, with a red box labeled '4' around it. The output shows the configuration for three wireless LAN adapters. The 'Wi-Fi' adapter configuration is highlighted with a red box, showing the following details:

```
Windows IP Configuration

Host Name . . . . . : 
Primary Dns Suffix . . . . . : saf.lan
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : saf.lan

Wireless LAN adapter Local Area Connection* 1:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . . : 
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter
Physical Address. . . . . : 
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Local Area Connection* 2:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . . : 
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #2
Physical Address. . . . . : 
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Wi-Fi:

Connection-specific DNS Suffix . . : 
Description . . . . . : Intel(R) Dual Band Wireless-AC 7265
Physical Address. . . . . : 
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : 
IPv4 Address. . . . . : 192.168.43.228(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Thursday, October 10, 2019 1:38:21 PM
Lease Expires . . . . . : Thursday, October 10, 2019 2:38:20 PM
Default Gateway . . . . . : 192.168.43.1
DHCP Server . . . . . : 192.168.43.1
DHCPv6 IAID . . . . . : 
DHCPv6 Client DUID . . . . . : 
DNS Servers . . . . . : 192.168.43.1
netbios over Tcpip. . . . . : Enabled
```

- 2) Next You have to find free and unused IP address in local WIFI network. Start this IP address selection process with checking IP address which has just last number increased by one comparing to *IPv4 Address* found in point 1). In our example, *IPv4 Address* from point 1) is *192.168.43.228*, so we first check *192.168.43.229*. IP address availability checkup is done from **Command Prompt** by executing command *ping* followed by IP address which You want to check. In our example:

```
Administrator: C:\Windows\system32\cmd.exe
C:\Users\DELL>ping 192.168.43.229
```

If IP address is already used then *ping* command execution results will show that reply within some milliseconds has been received from this IP address and such IP address can't be used for Aranet PRO base station:

```
C:\Users\ >ping 192.168.43.229
Pinging 192.168.43.229 with 32 bytes of data:
Reply from 192.168.43.229: bytes=32 time=10ms TTL=100
Reply from 192.168.43.229: bytes=32 time=30ms TTL=100
Reply from 192.168.43.229: bytes=32 time=4ms TTL=100
Reply from 192.168.43.229: bytes=32 time=12ms TTL=100

Ping statistics for 192.168.43.229:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 30ms, Average = 14ms
```

If such situation occurs, then please continue IP address selection by increasing last digit of IP address gradually by one until free unused address is found. In case IP address is free *ping* command execution will show message that *Destination host unreachable*:

```
Pinging 192.168.43.229 with 32 bytes of data:
Reply from 192.168.43.229: Destination host unreachable.
```

In this example, we assume that IP address *192.168.43.229* is free and we can use it for Aranet PRO base station configuration;

- 3) Additionally in **Command Prompt** check also connected local WIFI network security type (*Authentication*) with command *netsh wlan show interfaces*. Note here also *SSID* which is the name of local WIFI network You are connected to:

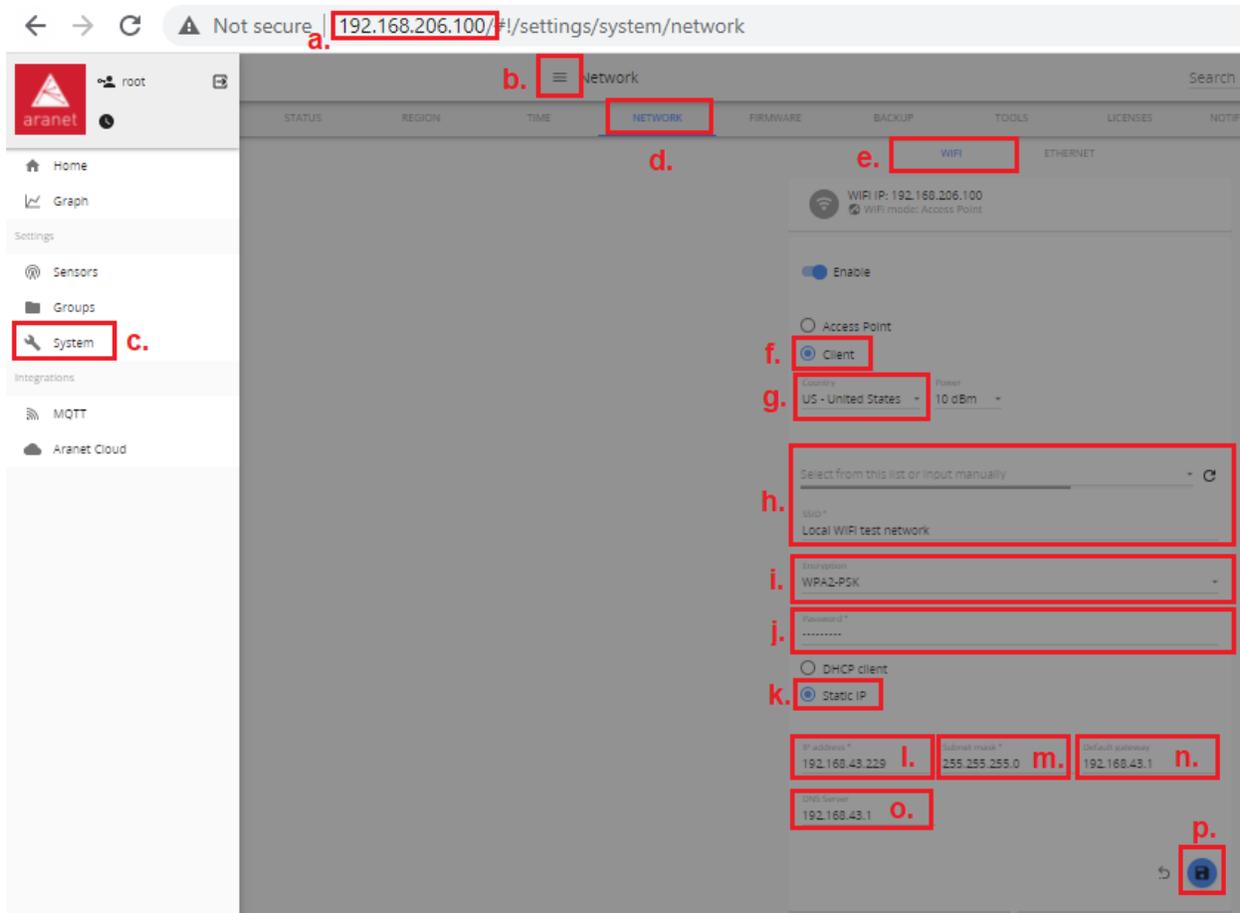
```
C:\Users\zigmars.strods>netsh wlan show interfaces

There is 1 interface on the system:

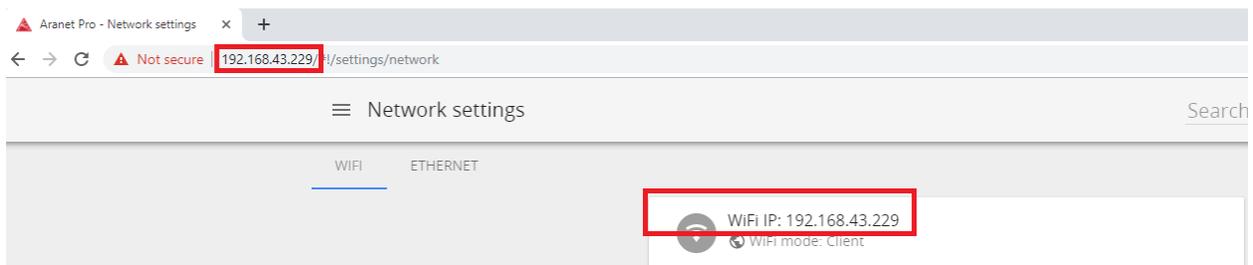
Name                : Wi-Fi
Description         : Intel(R) Dual Band Wireless-AC 7265
GUID                :
Physical address    :
State               : connected
SSID                : Local WIFI test network
BSSID               :
Network type        : Infrastructure
Radio type          : 802.11n
Authentication      : WPA2-Personal
Cipher              : CCMP
Connection mode     : Profile
Channel             : 6
Receive rate (Mbps) : 72.2
Transmit rate (Mbps) : 72.2
Signal              : 99%
Profile             : Local WIFI test network

Hosted network status : Not available
```

- 4) As next disconnect Your laptop from local WIFI network and connect to Aranet PRO base station built-in WIFI access point.
- a. Open any web browser and enter IP address of the Aranet PRO base station: 192.168.206.100;
 - b. Then click on  which will open new menu on left side;
 - c. Next in this menu select section **System**
 - d. Next choose tab **NETWORK**;
 - e. After that choose subtab **WIFI**;
 - f. In WIFI tab set base station to  Client mode;
 - g. Choose Your Country ;
 - h. In *Select from this list or input manually* choose You local WIFI network name which should be the same as **SSID** determined in point 3. In our example it is **Local WIFI test network**;
 - i. Choose Encryption of local WIFI network which was determined in point 2. In our example it is **WPA2-PSK**;
 - j. Enter Your local WIFI network Password* ;
 - k. Choose  Static IP ;
 - l. Set IP address* which was found in point 2 for the Aranet PRO base station, in our example: **192.168.43.229**;
 - m. Set Subnet mask* which was determined in point 1, in our example: **255.255.255.0**;
 - n. Set Default gateway which was determined in point 1, in our example: **192.168.43.1**;
 - o. Set DNS Server which was determined in point 1, in our example: **192.168.43.1**;
 - p. Click on Save icon  ;
 - q. When saved, then Your laptop will lose connection with Aranet PRO base station and base will be accessible only from laptops, computers, tablets or phones which are connected to the same local WIFI network, in our example: **Local WIFI test network**



5) Now You should be able to access Aranet PRO base station from laptop, PC, tablet or phone when both devices are connected to the same local WIFI network. So connect Your laptop back to Your local WIFI network and in web browser enter Aranet PRO base station IP address which was set in point 3.j, in our example, **192.168.43.229**:

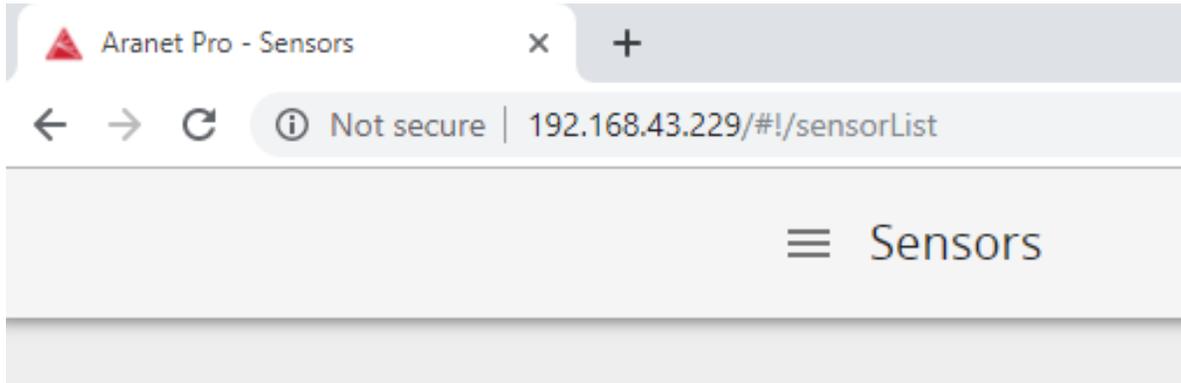


Next step would be setup Aranet base station access from Internet. We have general recommendations for Aranet PRO base station accessing from Internet in User Guide page 46: https://d110iodieynis3.cloudfront.net/wp-content/uploads/2017/04/01153048/PRO_UserGuide-NA-Ver-5.pdf

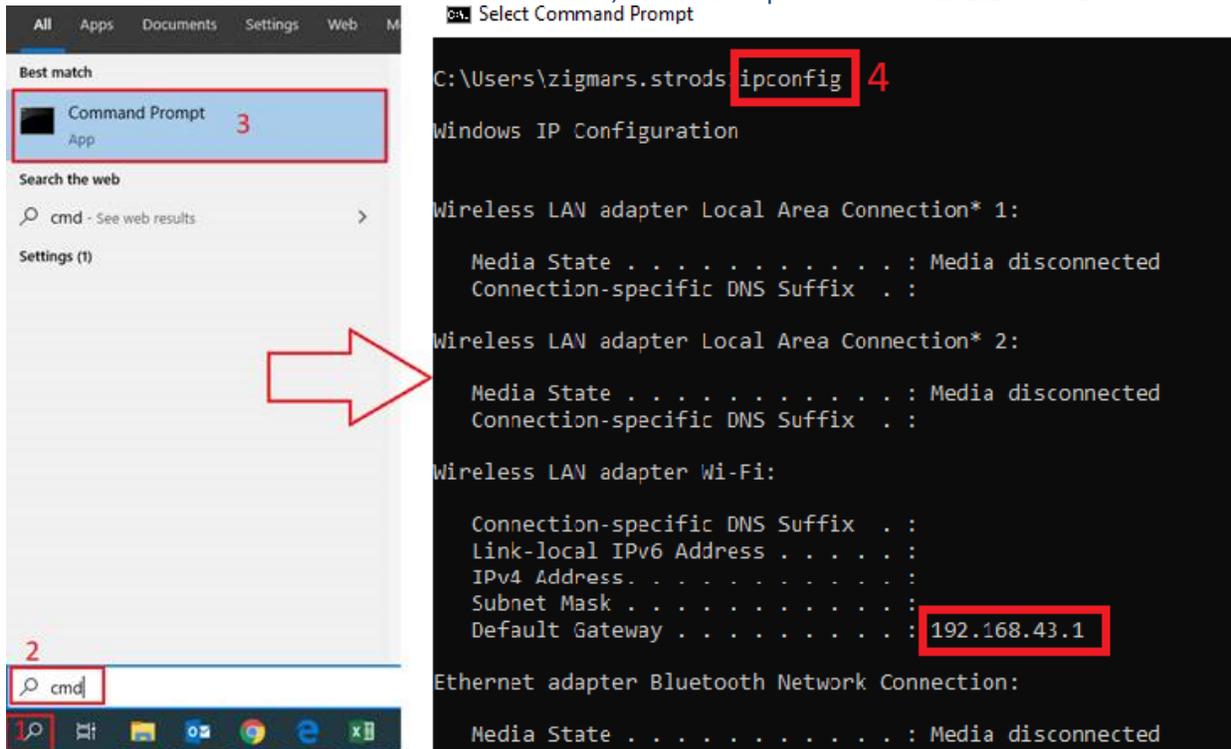
Port forwarding technique should be used for Aranet base station access from Internet. General idea on port forwarding and its setup is given, for example, on this video: <https://www.youtube.com/watch?v=2G1ueMDgwxw&t=1s>

Main steps in port forwarding enabling would be:

- 1) Aranet PRO base station should be properly connected to a local IP network and You should know IP address which is configured on Aranet PRO base station for connection to this local IP network (You should be able to access base station via ordinary web browser while connected in local IP network). In our example Aranet PRO base can be accessed in local network via IP address **192.168.43.229**:



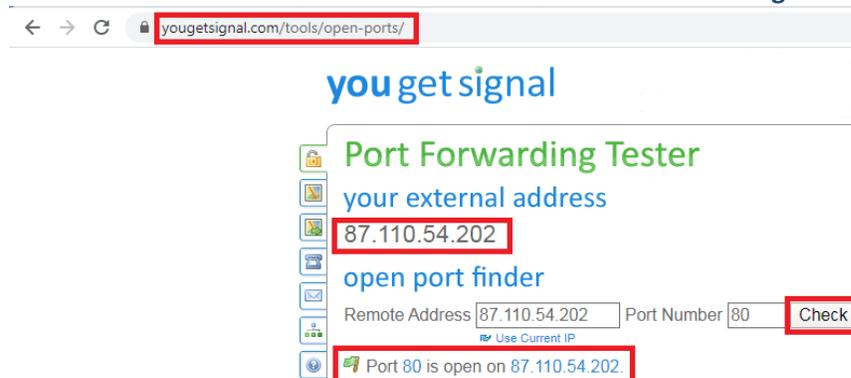
- 2) Next You should know local network address for the router/gateway where Aranet base station is connected and You should have administrator user rights for management on this router. If You do not have administration user rights for management on the router, please contact Your Internet Service Provider or local IT stuff for proper configuration. You can determine router local network address when connected with laptop to the same local network where the router is also connected. When connected on the same local network You have to open **Command Prompt** interface of Windows. In **Command Prompt** You should run command **ipconfig** and find line where **Default Gateway** is mentioned. In this line local network address of the router is shown, in our example below it is **192.168.43.1**:



3) Now you have to determine also Internet external public IP address for router where Aranet base station is connected. Additionally the router should have port 80 opened on it for external WEB access. To get router external public IP address and check status of port 80 on it You have to be connected to the same router with Your phone or laptop and You need to have WEB Internet access through this router. When connected to such router, visit <https://www.yougetsignal.com/tools/open-ports/> and there You will see router external public IP address, in our example below it is 87.110.54.202.

Here You can check also status of port 80 by pressing button. If the port 80 is open, then confirmation message will be shown that 🟢 Port 80 is open and You can proceed with next steps of these guidelines. If 🚫 Port 80 is closed, then please contact Your Internet Service Provider and ask for some solution.

Note that router should have static external public IP address which does not change over time otherwise if the router address is dynamic and will change over time You will not be able to access also Aranet base station when router address has changed:



4) If You have all previous points confirmed then while connected to the local IP network with laptop use web browser to log in to the router local network IP address (determined in point 2) with administrator user and password and create port forwarding rule on the router. In order to set such rule user usually has to create port forwarding record which contains

- local IP address of the Aranet base station (determined in point 1),
- port number for WEB access to Aranet base station which is **80**,
- port number for external Internet WEB access to Aranet base station which could be set to **8100**, but in general could be any open and unused port on the router.

Unfortunately port forwarding rule setup interface on the routers is not standardized and not uniform as each vendor has made it in its own way. For precise way how to do port forwarding on a specific router one needs to check router's own user manual/guide.

For Huawei B315 (B525) routers some general configuration recommendations could be found: <https://d1l0iodieynis3.cloudfront.net/wp-content/uploads/2017/03/01173334/How-to-remotely-connect-to-the-Aranet-PRO-from-Internet.pdf>

5) If everything is done correctly then now You should be able to access Aranet base station from Internet via ordinary web browser just by entering external public IP address of Your router (determined point 3), semicolon and then port number for Aranet external Internet WEB access (set in point 4.c). In our example the router external IP address is 87.110.54.202 and port for Aranet external Internet WEB access is set to 8100, then we should enter in web browser address **87.110.54.202:8100**. Note that You will not be able to access Aranet PRO base station via external Internet WEB address while connected to the same local IP network. In local network You should still use local IP address from point 1.