ACKSYS
COMMUNICATIONS & SYSTEMS

APPLICATION NOTE

APNUS043 How To Configure Router in Repeater Mode

February 2025

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1. Introduction

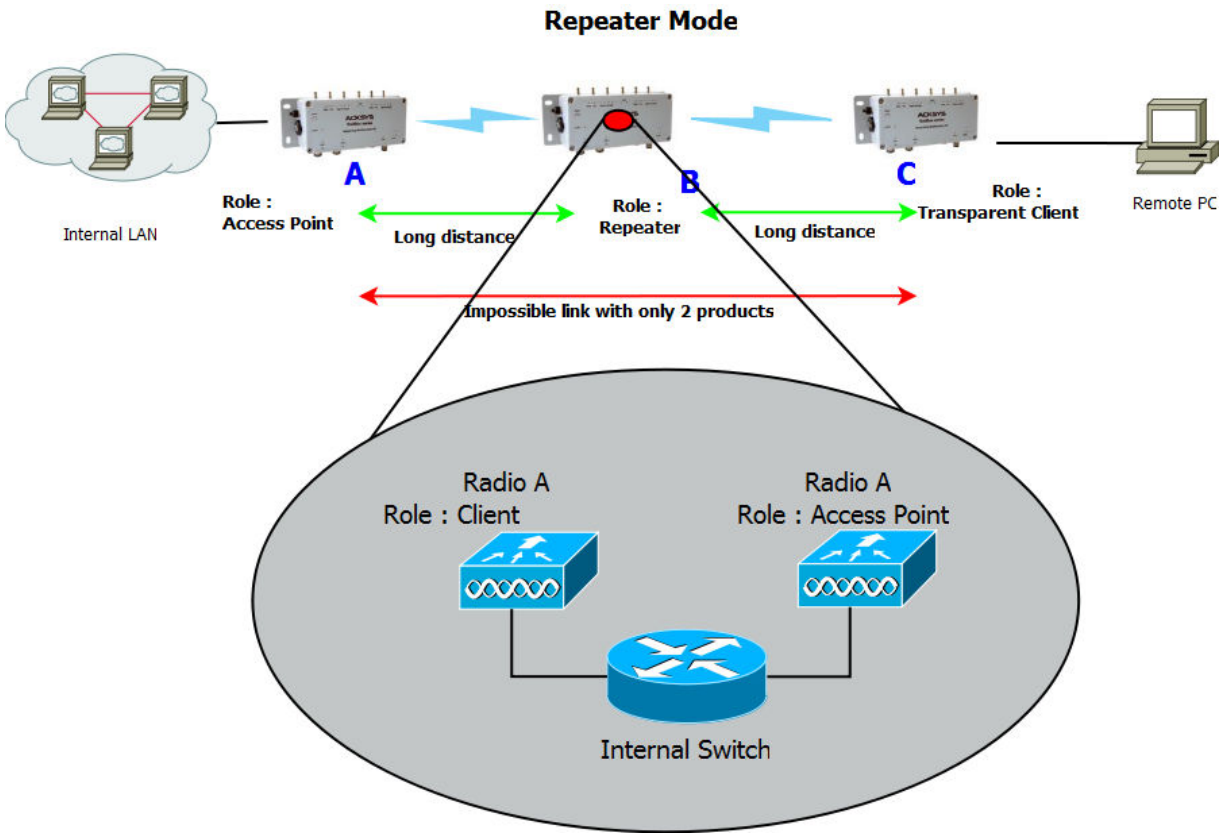
This document provides step-by-step instructions on configuring an ACKSYS router to operate in repeater mode. Repeater mode enables the router to extend the coverage of an existing wireless network by acting as an intermediate node, relaying traffic between a client and an Access Point (AP).

In this application note, we will explain in detail the basic steps required to configure Acksys Router as repeater or relay mode.

2. Line Topology repeater (single radio card) Architecture

it is possible to configure a dual-radio router in repeater mode to take advantage of two separate channels, significantly improving performance compared to single-radio repeaters. This configuration separates the communication channels for the uplink (to the main AP) and the downlink (to the clients), avoiding the performance bottleneck of using a single radio for both tasks.

In this application note, we will use 1 Acksys Router with One radio in Repeater mode as relay.



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3. ACKSYS Router configuration

Before we begin, let's overview the configuration that we are attempting to achieve and the prerequisites that make it possible in this application note :

- 1 Any type of Acksys Router in single radio as repeater configured in in both role (Client and AP role) Router B
- 2 Any type of Acksys Router in single radio configured in 2 different role (Router A) , one in Client and the second AP role (router C)
- A Linux PC or Windows PC to configure the 3 routers

WARNING: In repeater mode when using a single radio, if the router is operating in relay mode, network connectivity is only possible if the channel configuration in both client mode and AP mode matches the configuration of the other connected Clients or APs. This ensures seamless communication and avoids connectivity issues due to mismatched frequencies.

Configuring Routers

If you have familiarized yourself with the configuration scheme, we can start configuring the router using instructions provided.

Parameter	Router A	Router B	Router C
IP Address	192.168.1.252/24	192.168.1.252/24	192.168.1.253/24
SSID	• SSID_AB	• SSID_AB • SSID_BC	• SSID_BC
Role	• AP Role	• AP • Client Role	• Client Role

Product A		**Product B**	
Device Configuration (Radio A)		Device Configuration (Radio A)	
Value	**Parameter**	**Parameter**	**Value**
Enable device	on	Enable device	on
802.11 mode	802.11a+n	802.11 mode	802.11a+n
HT mode	20MHz	HT mode	20MHz
Channel	36	Channel	36
Country code	FR	Country code	FR
Interface Configuration 1(Radio A)		Interface Configuration 1 (Radio B)	
Value	**Parameter**	**Parameter**	**Value**

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Role	Access point
ESSID	SSID_AB

Product C	
Device Configuration (Radio A)	
Value	**Parameter**
Enable device	on
802.11 mode	802.11a+n
HT mode	20MHz
Channel	36
Country code	FR
Interface Configuration 1 (Radio A)	
Parameter	**Value**
Role	Client
Bridging mode	4 addresses format (WDS)
ESSID	SSID_BC

Role	Client
Bridging mode	4 addresses format (WDS)
ESSID	SSID_AB

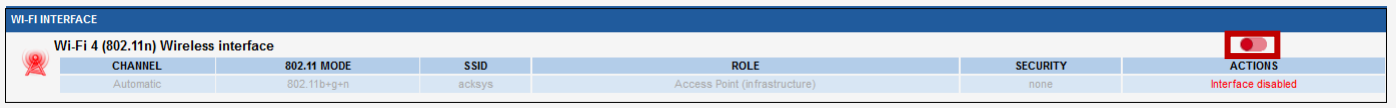
Interface Configuration 1 (Radio B)	
Parameter	**Value**
Role	Access point
ESSID	SSID_BC

NOTE: The **4-address format** is a powerful feature for seamless MAC address preservation and transparent Layer 2 communication. However, due to compatibility limitations, it should only be enabled in environments with ACKSYS routers on all nodes of the wireless network. For mixed-vendor setups, alternative configuration like ARPNAT (by default in client mode) is recommended.

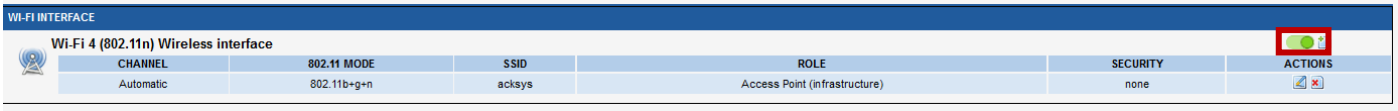
Configuring Router B

Configuring SSID in AP role

By default the WiFI Adaptor is disabled therefore in this application note, we will create an SSID to associate to the WIFI adapter to allow end device connected on its.
In the GUI, go to Setup → Physical Interfaces → Click WiFI Adaptor to On



Click the "Edit" button located to the right and your SSID configuration page:



- Role: Client
- ESSID: SSID_AB
- Network: LAN
- Click on Save

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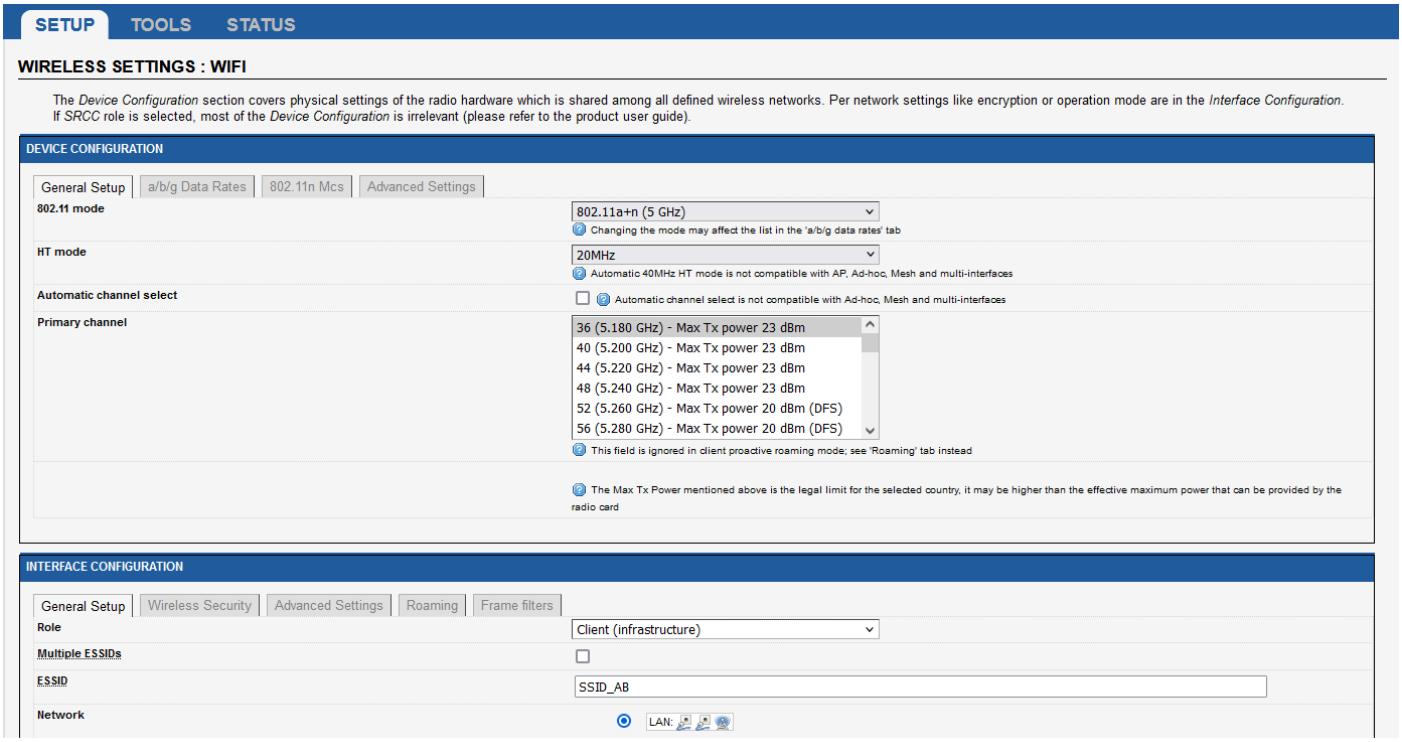
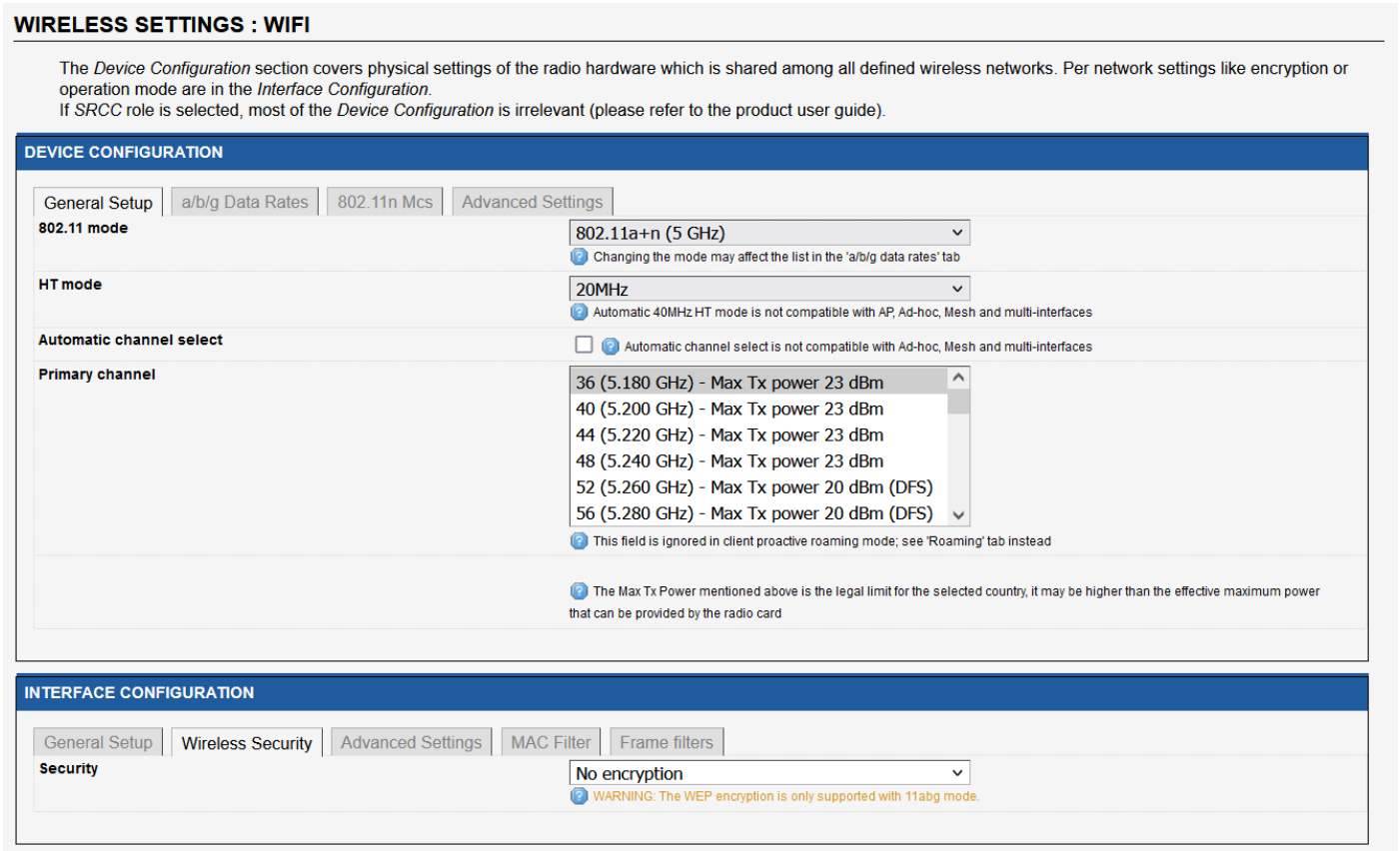


- Security: No encryption (only in this note but we invite partner to set a strong password)



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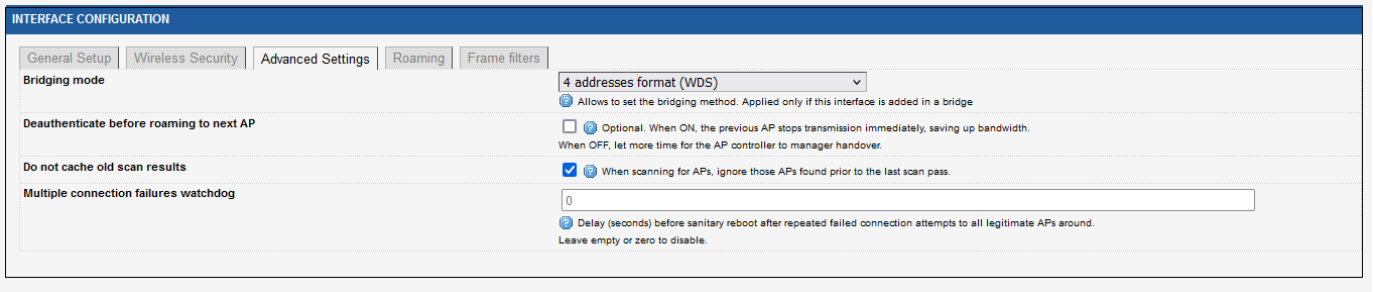
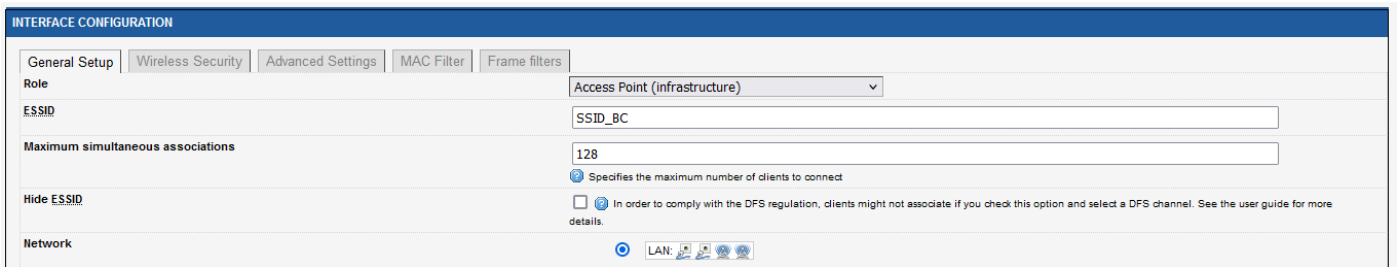


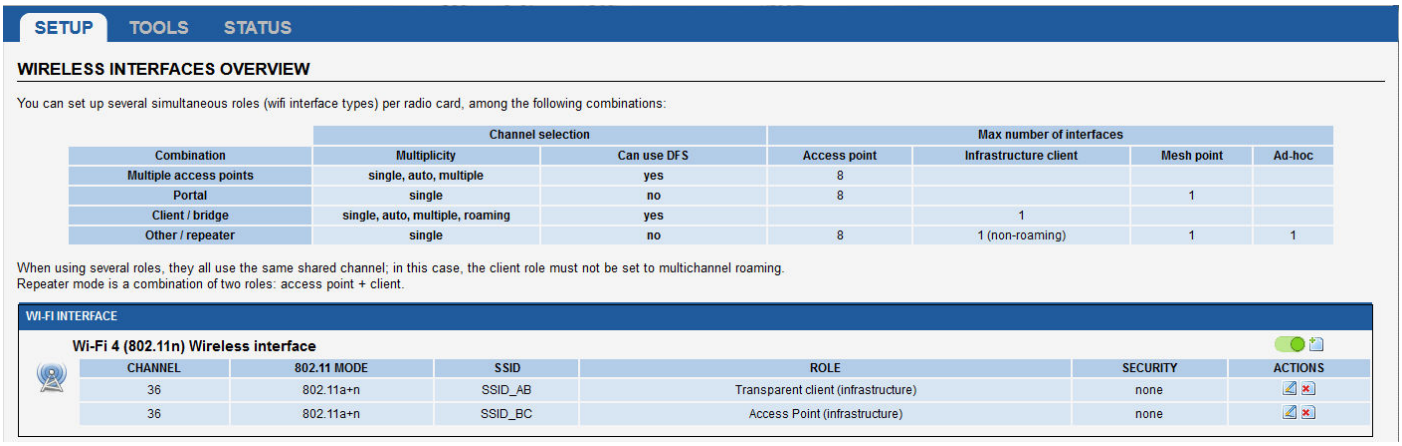
Configuring SSID in Client role

In the GUI, go to Setup → Service → Cloud to configure the MQTT client to interact with the MQTT Broker installed on LAN Network with the following information.



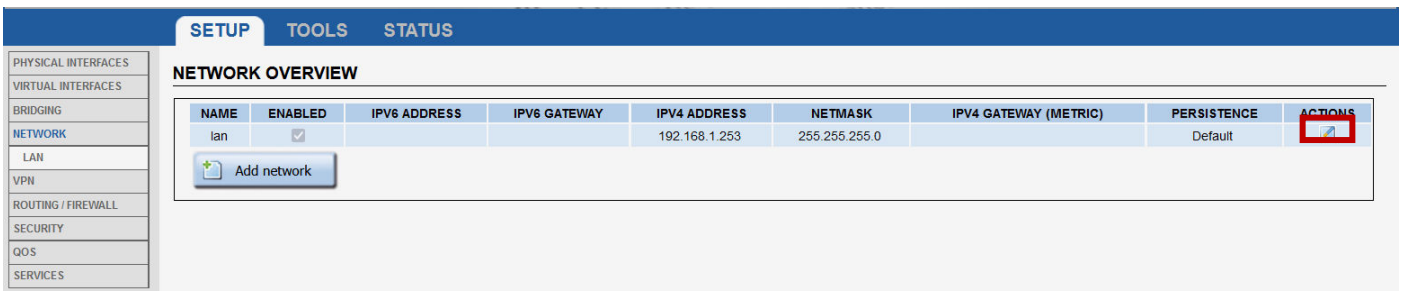
Repeater Router Configuration OverView

The configuration should after the below screenshot when finishing the Router B playing AP and Client role at the same time with different SSID.



Configuring Router B Network

In the GUI, go to Setup → Physical Interfaces → Edit LAN Interface



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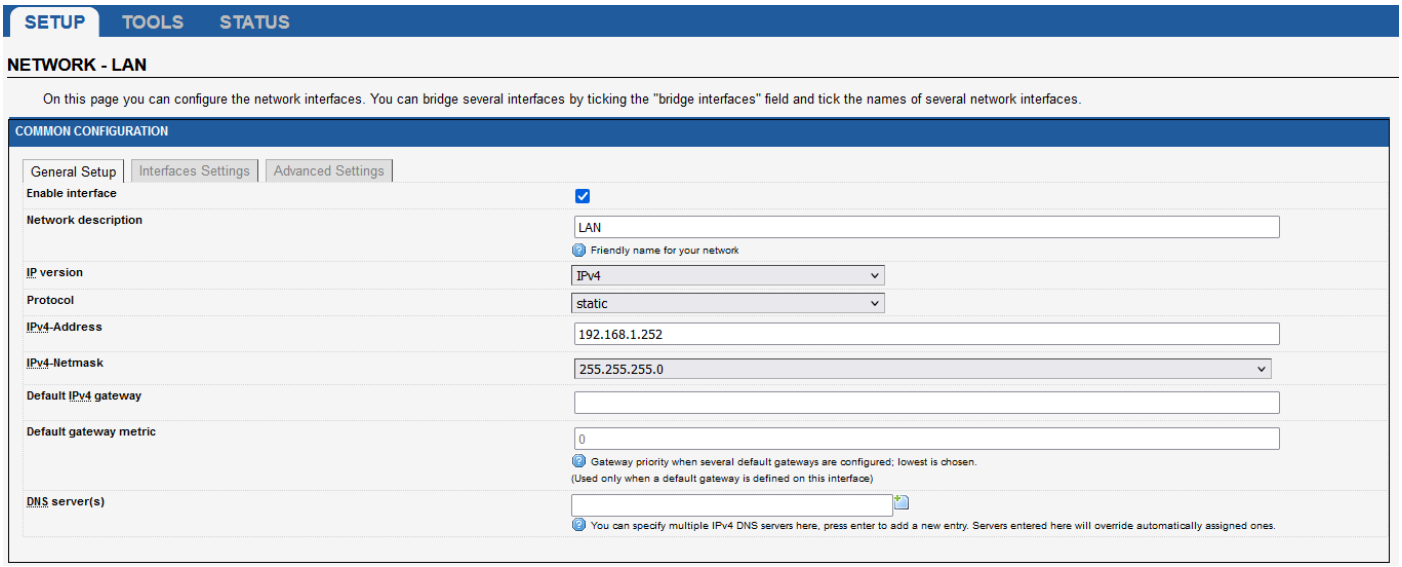
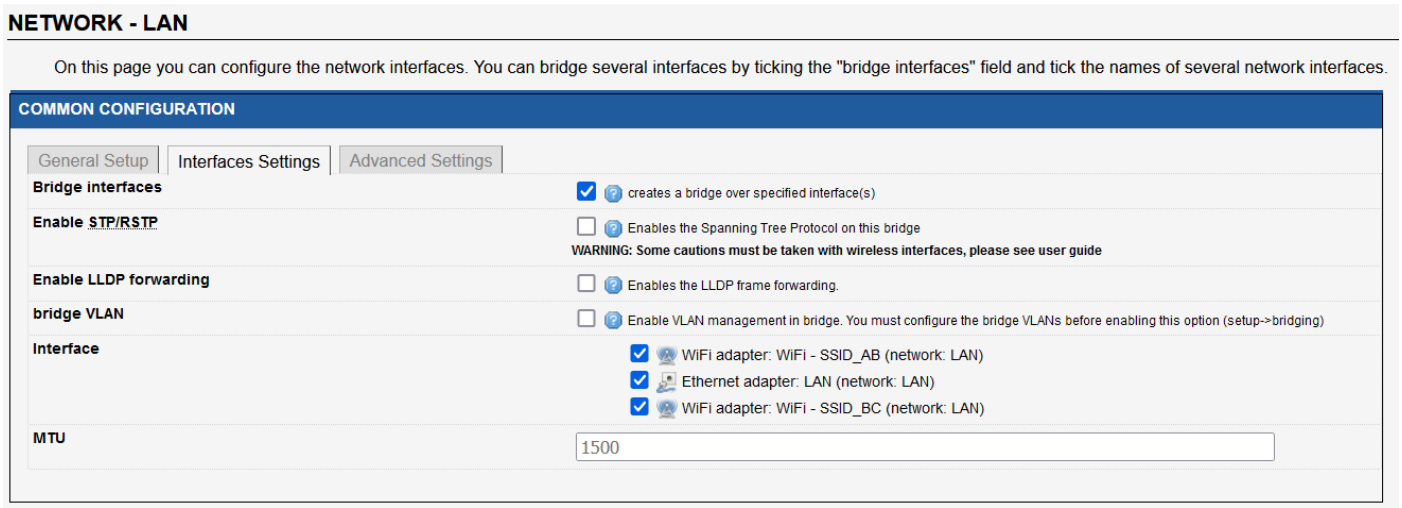
Click the "Edit" button located to the right and let configure LAN Interface.

- General Setup
  - Network description :PUBLIC (use your custom name)
  - Protocol: Static
  - Select IPv4 Address IP family : 192.168.1.252
  - IPv4-Netmask:255.255.255.0
  - Save



- Interface Settings
  - Bridge Interfaces: Click to enable
  - Interface: by default all interface are bridged
  - Click Save



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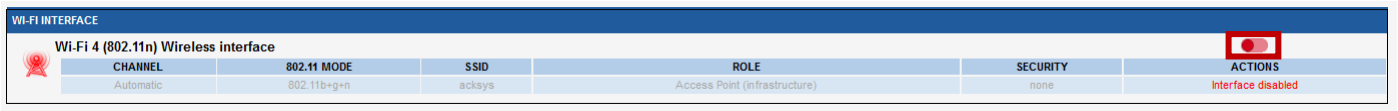
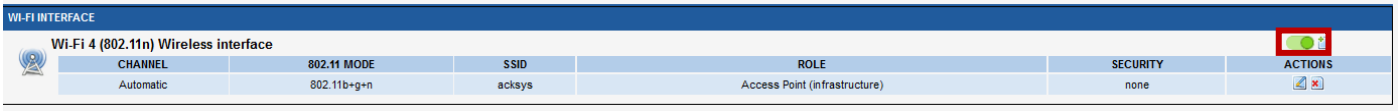
Configuring Router A

Configuring SSID in AP role

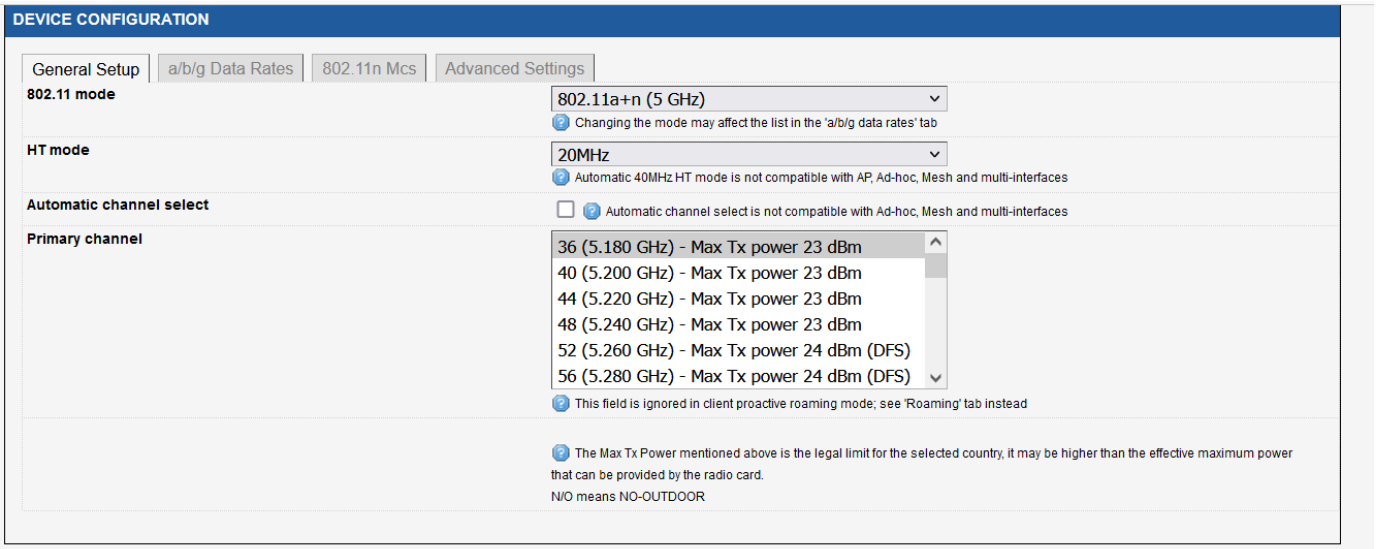
By default the WiFI Adaptor is disabled therefore in this application note, we will create an SSID to associate to the WIFI adapter to allow end device connected on its.
In the GUI, go to Setup → Physical Interfaces → Click WiFI Adaptor to On

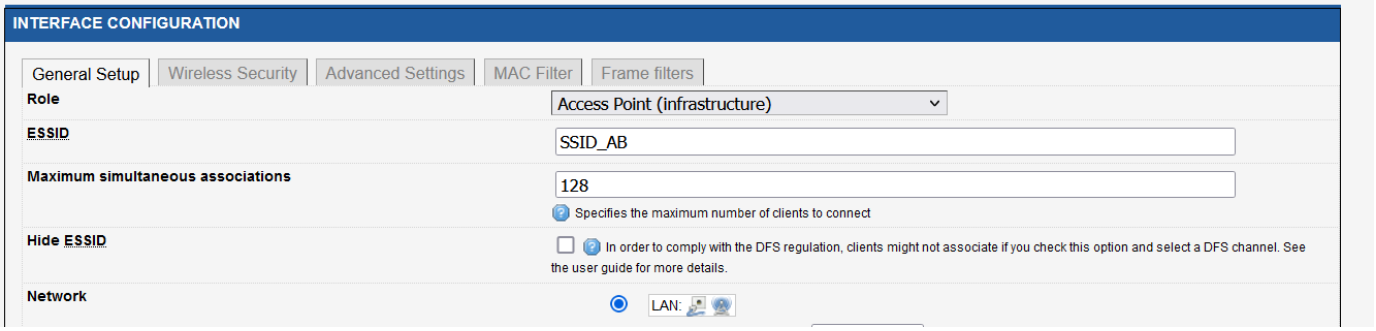


Click the "Edit" button located to the right and your SSID configuration page:



- Role: Access Point
- ESSID: SSID_AB
- Network: LAN
- Click on Save





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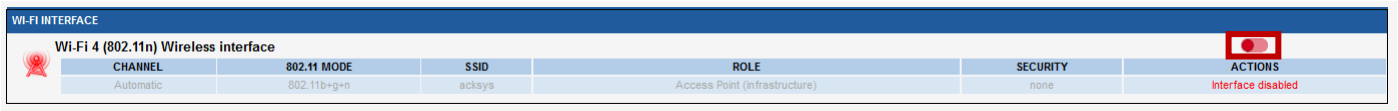
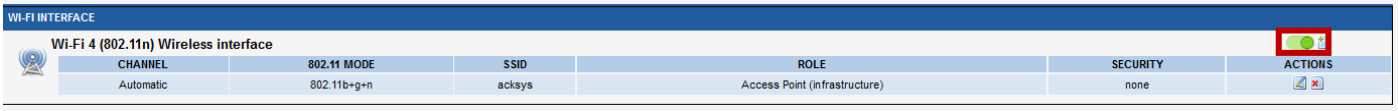
Configuring Router C

Configuring SSID in Client role

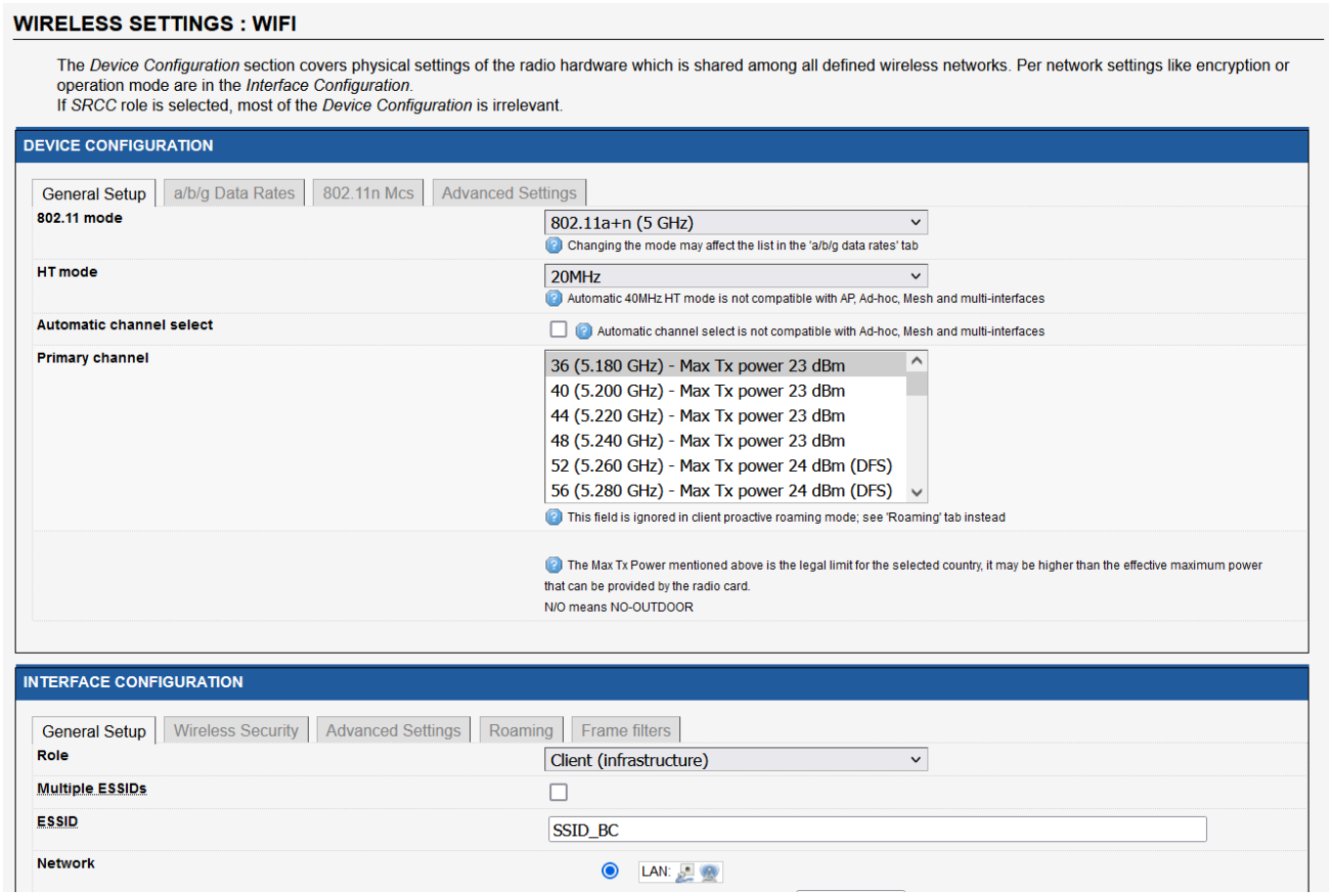
By default the WiFI Adaptor is disabled therefore in this application note, we will create an SSID to associate to the WIFI adapter to allow end device connected on its.
In the GUI, go to Setup → Physical Interfaces → Click WiFI Adaptor to On



Click the "Edit" button located to the right and your SSID configuration page:



- Role: Client
- ESSID: SSID_BC
- Network: LAN
- Click on Save



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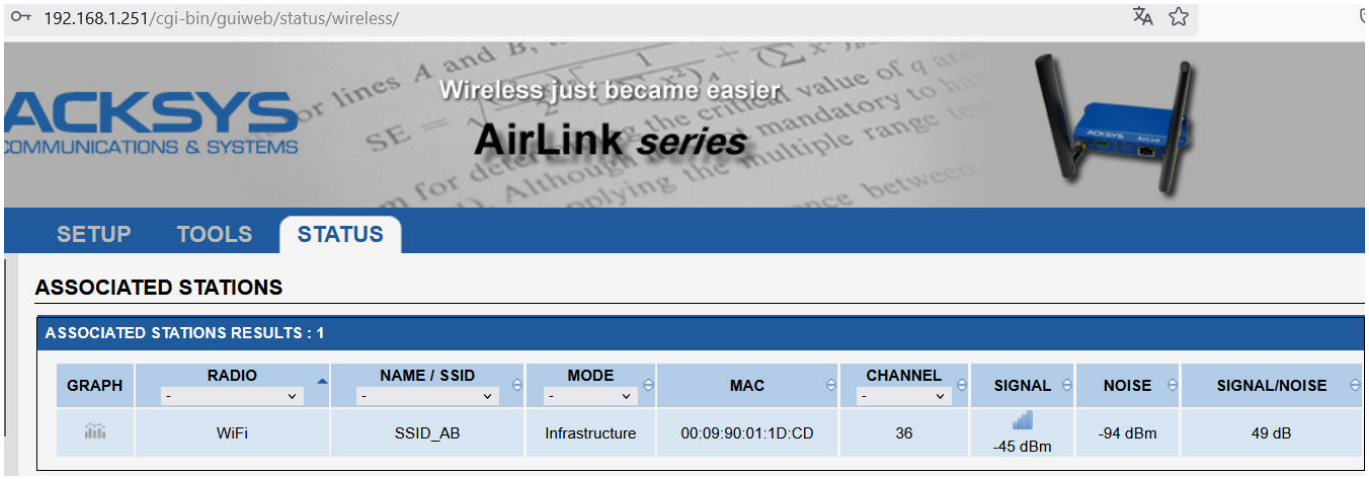
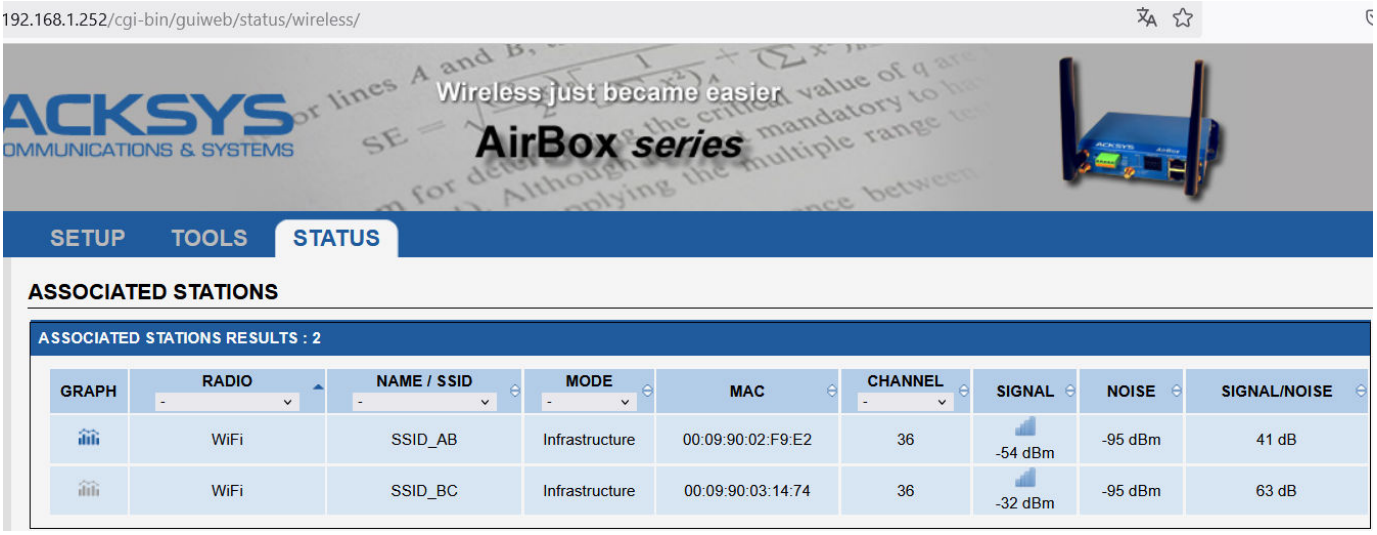
4. TESTING

If you've followed all the steps presented above, your configuration should be finished. But as with any other configuration, it is always wise to test the setup in order to make sure that it works properly.

Wireless Status on Router A



Wireless Status on Router B



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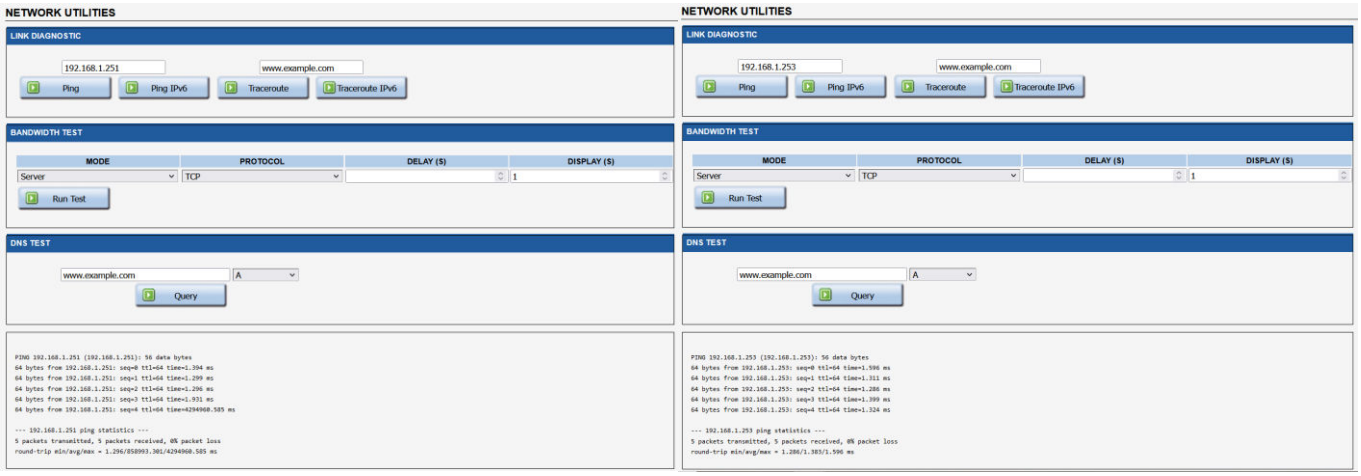
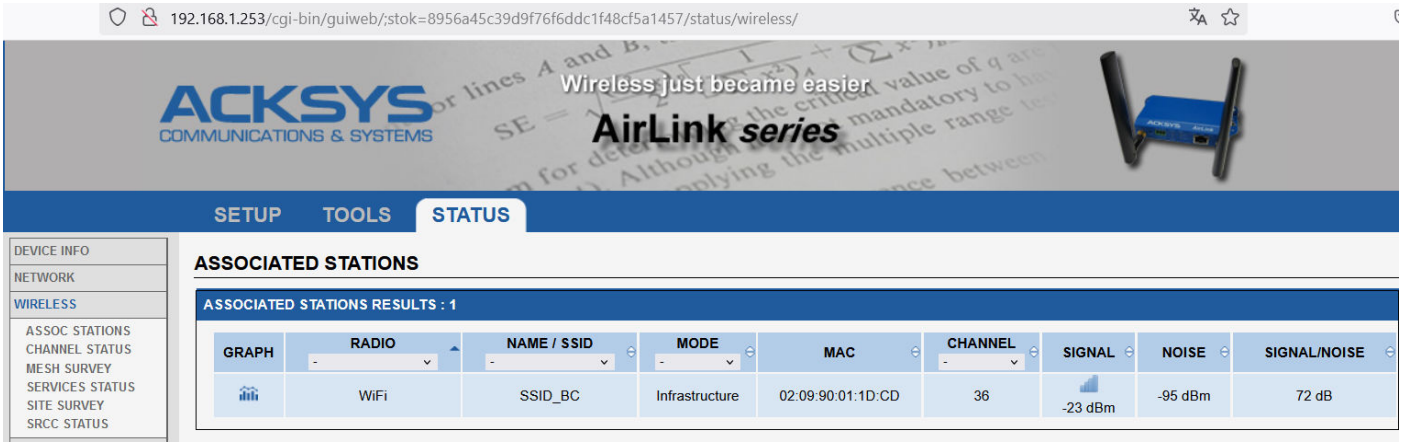
Connectivity Test on Router B

Let testing IP connectivity from Router B configured in Repeater Mode with the Router A in AP mode and Router C in Client mode:



Wireless Status on Router C



For larger networks involving multiple routers (e.g., Router C connecting to Router B), ensure that LOS is maintained between the respective AP-Client pairs. Use tools like Wi-Fi analyzers or site survey tools to validate coverage and avoid interference.

Support : https://support.acksys.fr

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