XR SOLUTION ADMINISTRATOR

XR Solution Administrator

XR Solution Technical Certification Training

Session 2:

Training | Knowledge Check | Lab Exercise

March 2022 (Updated January 2023)

SIERRA WIRELESS®

XR SOLUTION
ADMINISTRATOR

Session 2

- Review and Lab Recap
- Labels Deep Dive
- Basic XR and AirLink® OS Use
- What’s Next

REVIEW AND LAB RECAP

Review and Lab Recap

What are your questions from last week and the lab?

What did you learn during the lab?

What You Should Know

- What information is on what labels, and why
- Location of specific status information in AirLink OS:
  Link and interface states | Network states (LAN and WAN) | Current routing status | Subsystem states: location, CPU, temperature
- How to perform basic configuration settings
- How to create, save, and load templates locally
- How to perform basic operations

LABELS DEEP DIVE

On the Router

On the Box

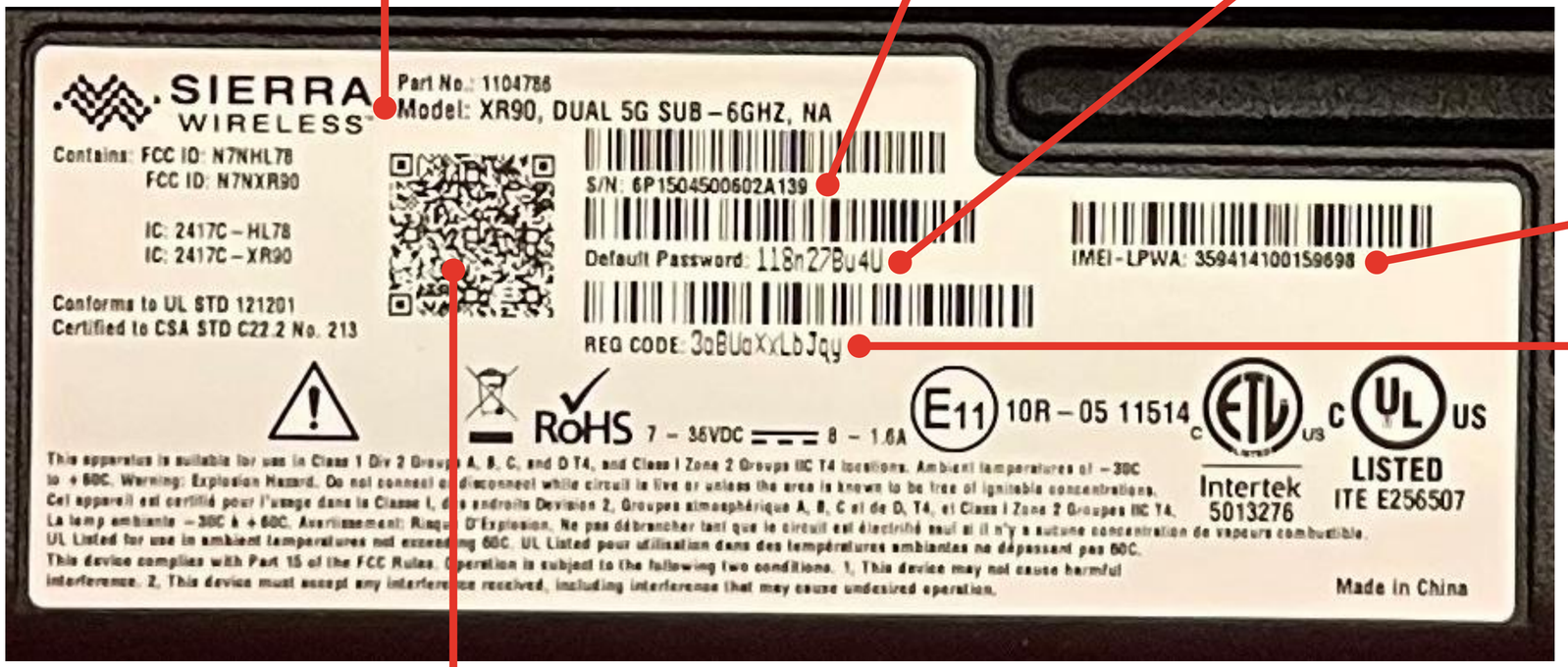
Router Label

XR90 Model

Serial Number

Default Password

* Only exists on this label



6P1504500602A139;359414100159698;118n27Bu4U;1104786;8 12320 00615 6;3aBUaXxLbJqy

LPWA IMEI

** Will be removed shortly

Registration Code

** Exists on router label or from production/distribution

The XR80 label includes the integrated 4G/5G IMEI

Exterior Box Label

The XR80 label includes the integrated 4G/5G IMEI

Part # and Description

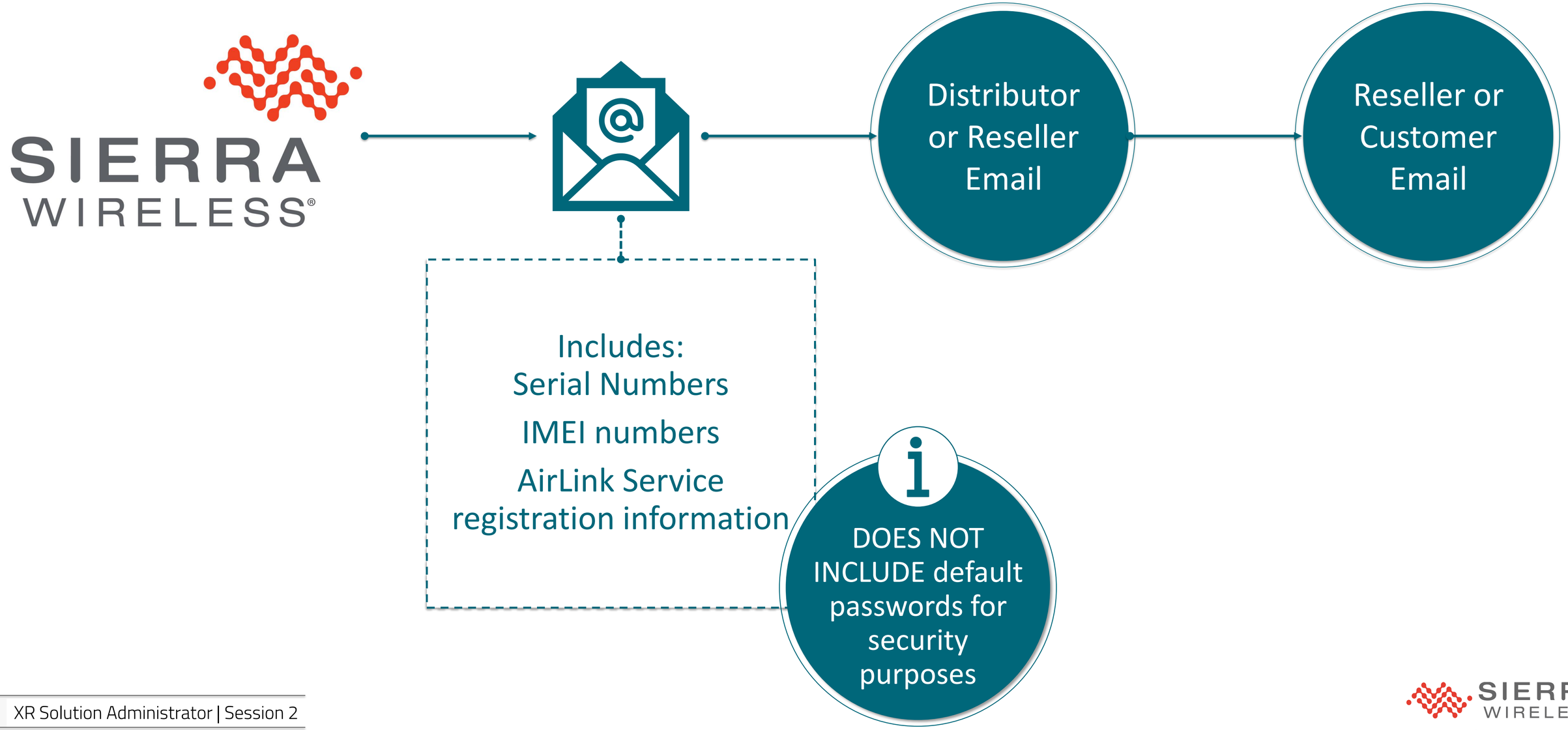
Serial Number

LPWA IMEI

XP cartridge radio IMEIs
(1 or 2) attached during production

6P1504500602A139; 359414100159698; 8 12320 00615 6; 1104786; 350546850112507; 350546850112457;

Other Sources of Label Information



BASIC XR AND AIRLINK OS USE

Basic Abilities on XR and AirLink OS

Specific Status Information

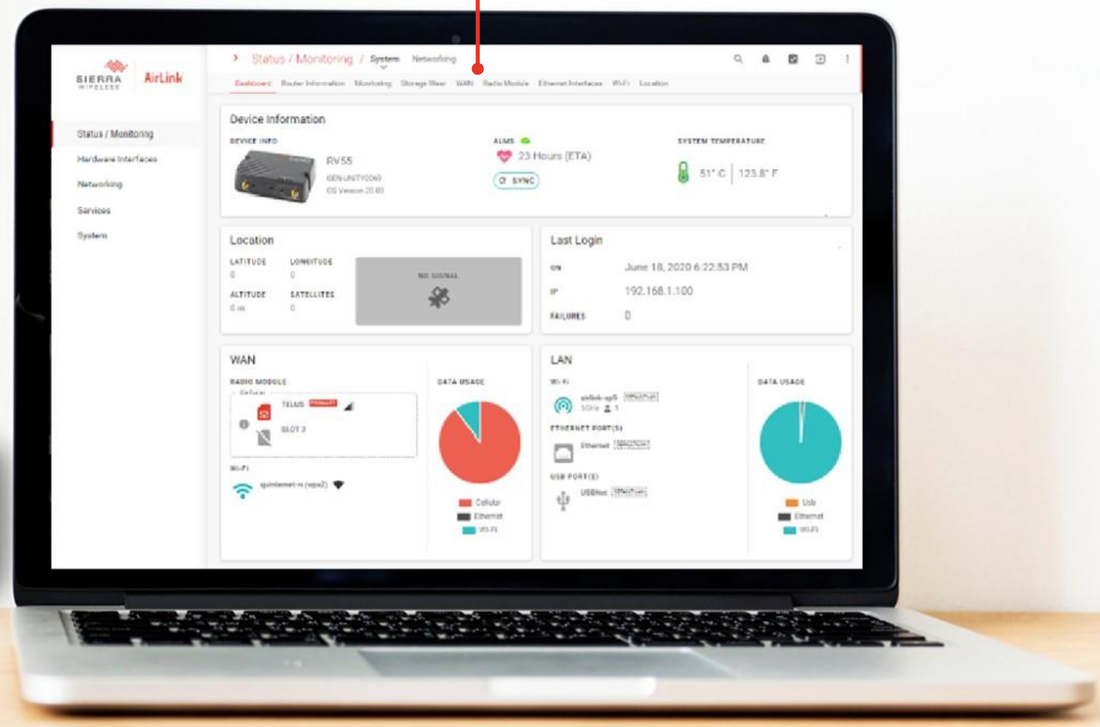
Basic Configuration Settings

Working with Templates Locally

Basic Skills and Abilities

Specific Configuration Settings

Working with the XR Series Router

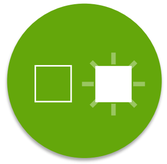


Working with the XR Series Router

Things you should be able to do with an XR Series router:

Physical Setup
SIM cards, antennas, connectors

Perform a factory reset



Understand typical LED behavior

Register router for AirLink Services

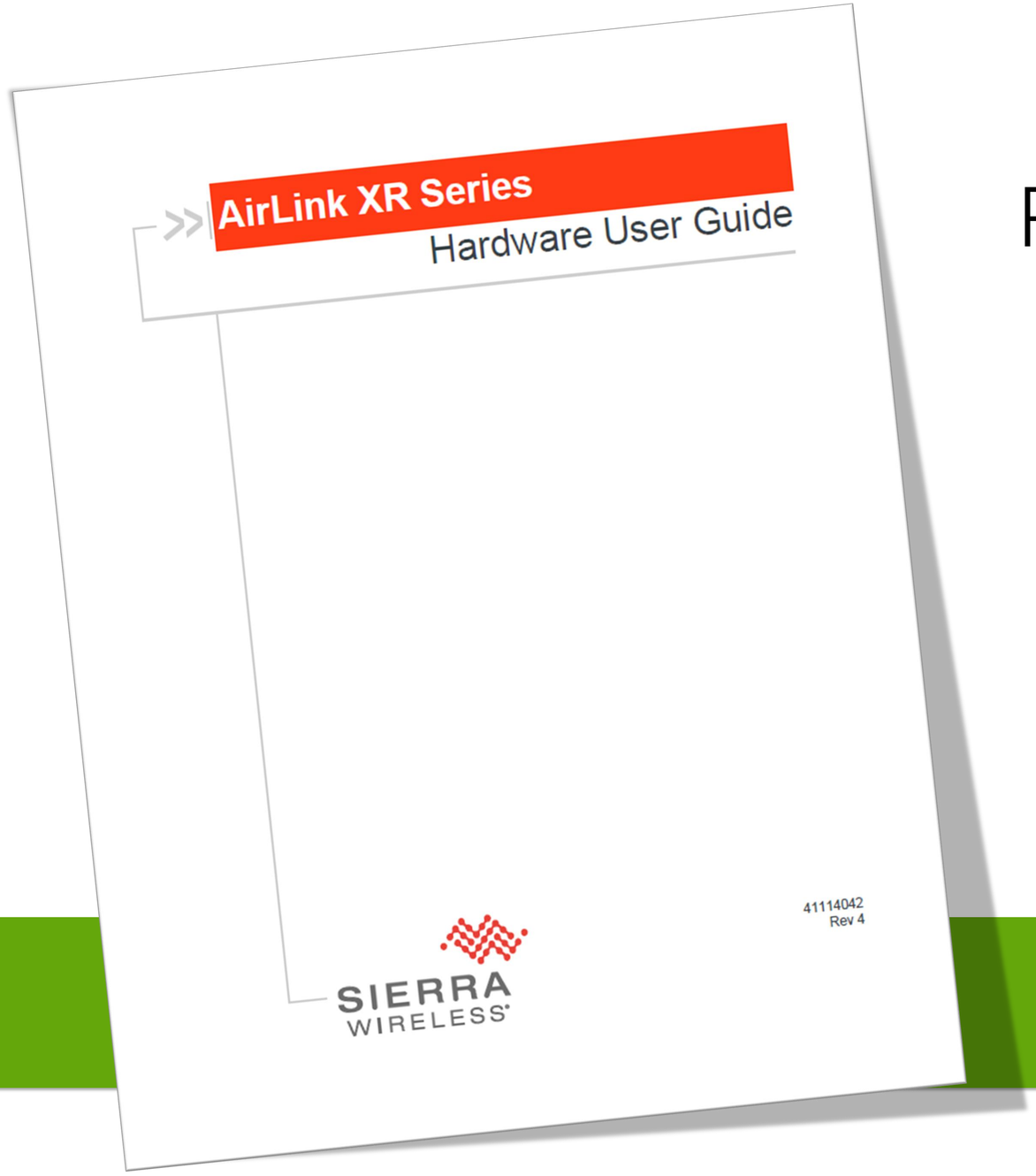
Save and load a configuration template

Upgrade AirLink OS

Capture system information for a support ticket
logs, template, TS package

Understand WAN default priority

Attach an XP cartridge



Find Information on The Source

AirLink OS software to upgrade without using ALMS

Configuration Guides
Hardware Guides
LED behavior
Physical setup
Factory reset (button)

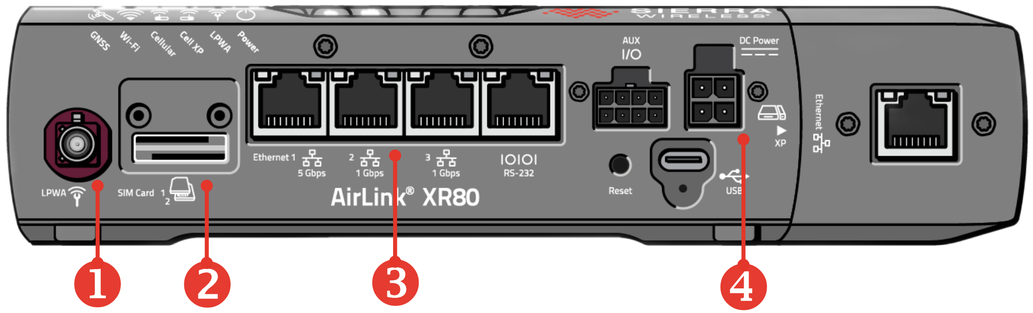
Link: https://source.sierrawireless.com

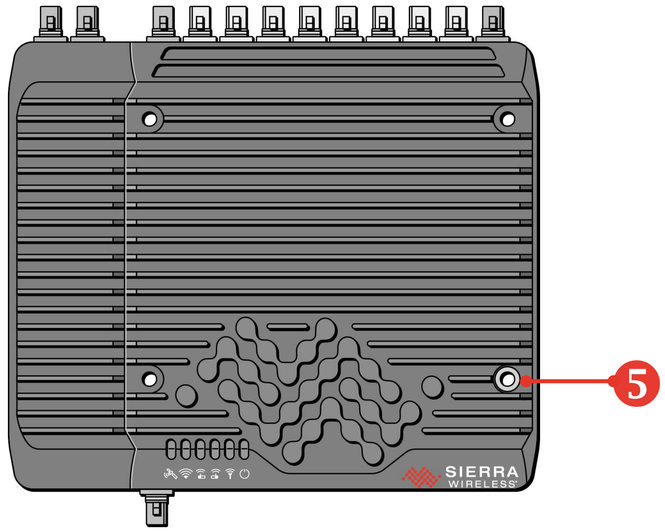
SIERRA WIRELESS

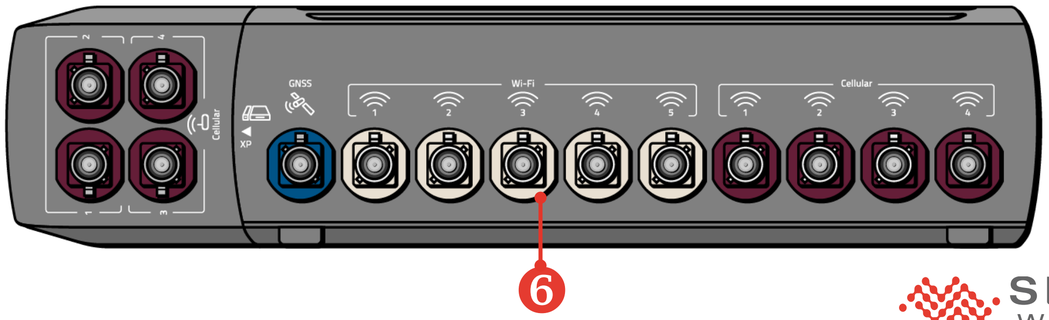
Set Up the XR Series Router

The complete setup includes:

1. Attach LPWA antenna
2. Insert SIM card(s)
3. Connect required Ethernet cables
4. Connect power (AC or DC)
5. Secure the router
6. Connect required antennas







These steps may not always occur in this sequence. It depends on the project needs.

Some items are dependent on the installation type: fixed or mobile, cabling required, and the specific wiring of the power harness.

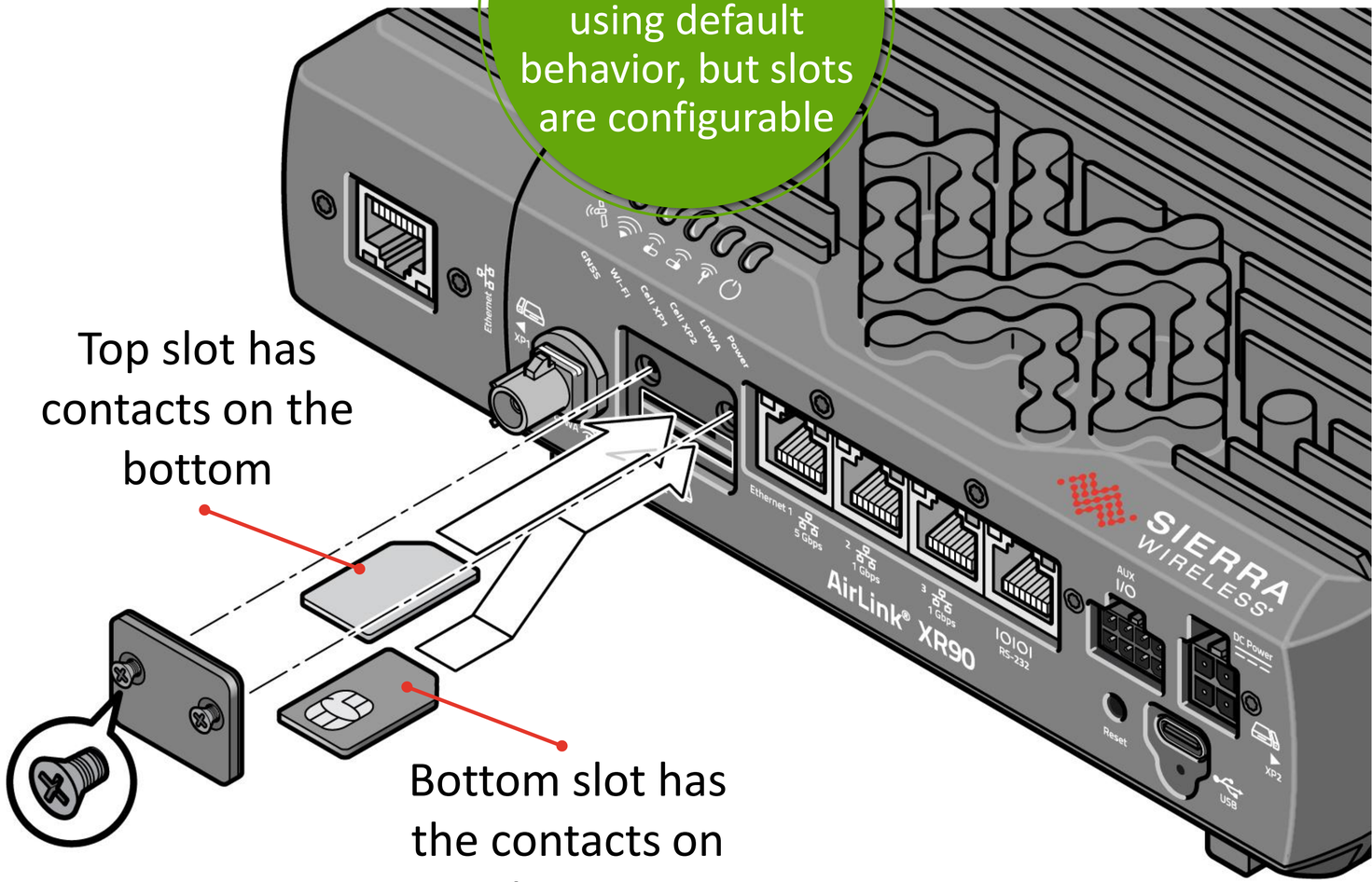
2 Insert the SIM cards

Primary SIM and secondary SIM installation:

- Primary in the top slot
- Secondary in the bottom slot.

Scenarios	
2 Dual-Radio	↖ Secondary carrier failover

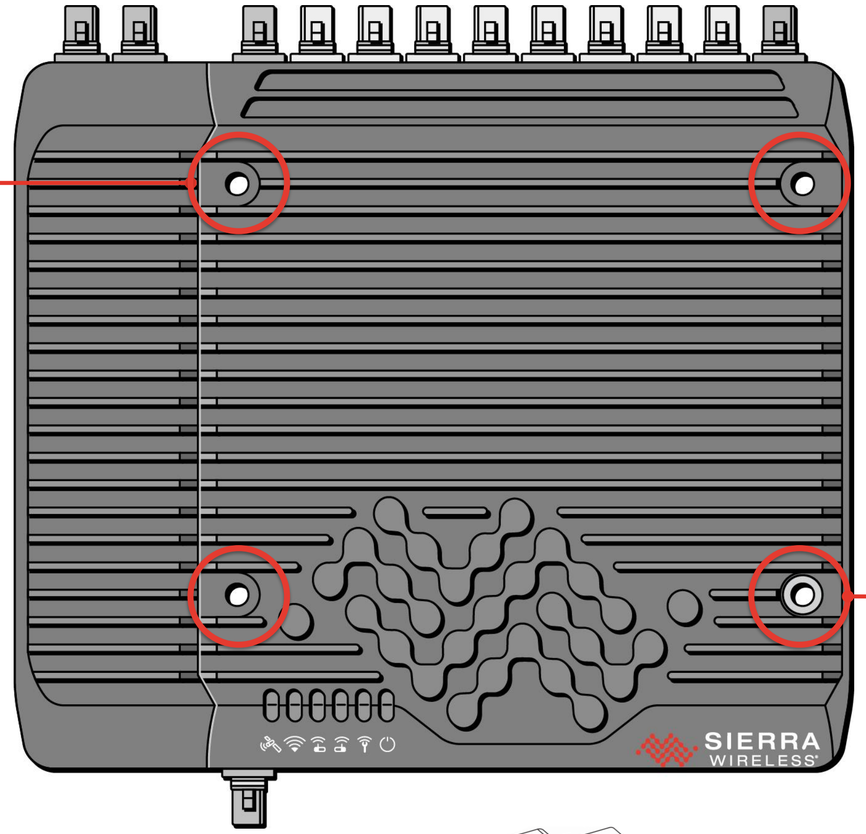
Configuration is not needed if using default behavior, but slots are configurable



5 Secure the Router

The router has 4 bolt holes

All XR Series models have same layout and spacing

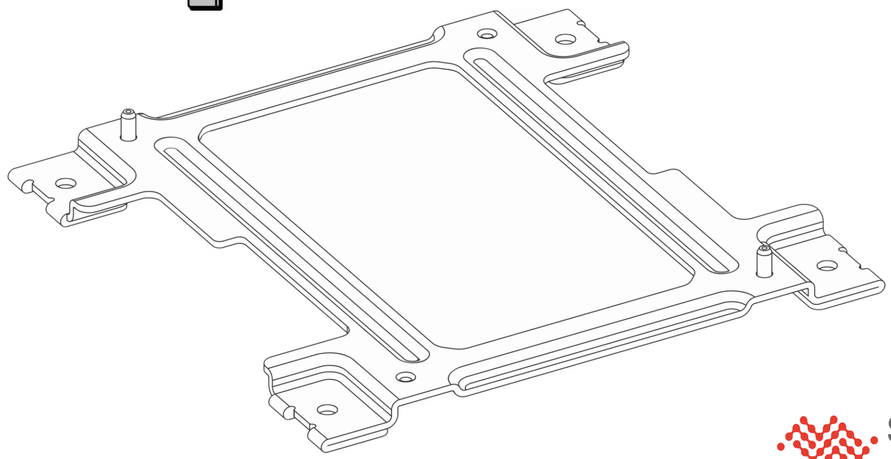


Ground location

Plan for:

- Access to antenna connectors and Ethernet ports
- Bend radius of antenna cabling
- Visibility of LEDs for troubleshooting
- Possible addition of an XP cartridge in the future
- Ground connection
- Protection of cable connectors
- Physical security

A quick-disconnect bracket is available



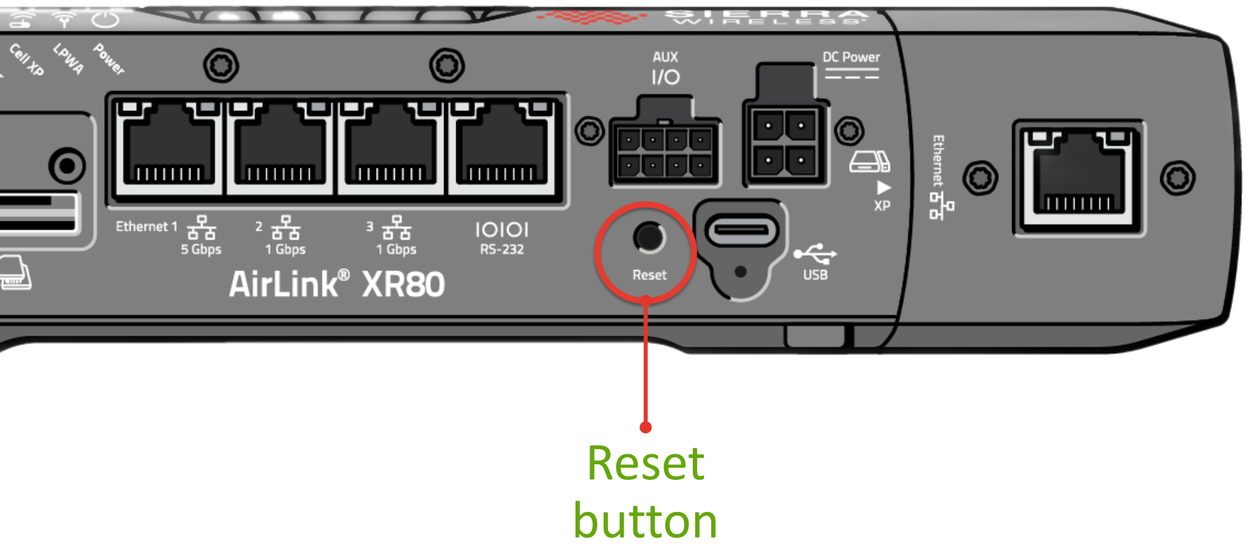
Factory Reset: Two Ways

Apply a Factory Reset in two ways:

1

Hardware:

Press and hold the Reset button for between 20-40 seconds. Release while Power LED is blinking Yellow

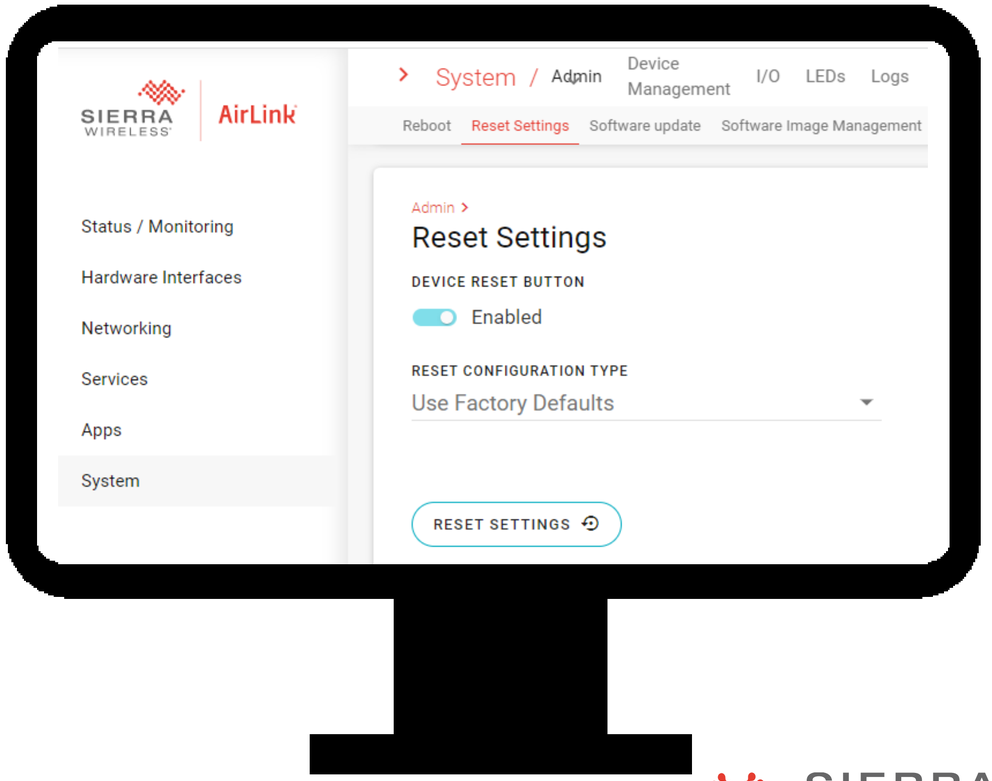


Reset button

2

AirLink OS:

Go to **System** > **Admin** > **Reset Settings**

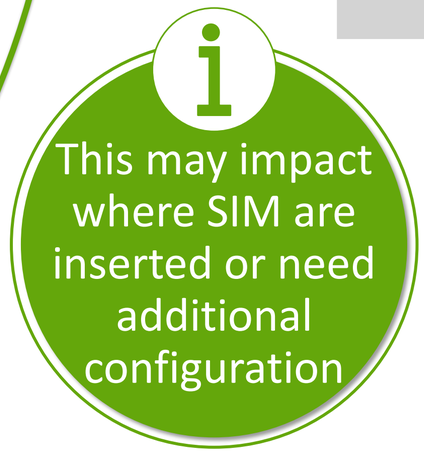


Default Priority for Multi-WAN

The XR Series support custom routing over different WAN links. Managing that level of detail is beyond basic use.

For basic use, understand what the default behavior is when multiple WAN links are available.

Interface	Order, if present
Ethernet	• Eth 1 • Eth 2 • Eth 3 • Eth XP/XP1 • Eth XP2
Wi-Fi WAN	• Wi-Fi 5GHz • Wi-Fi 2.4GHz
Cellular	• Cell INT/XP1 • Cell XP/XP2

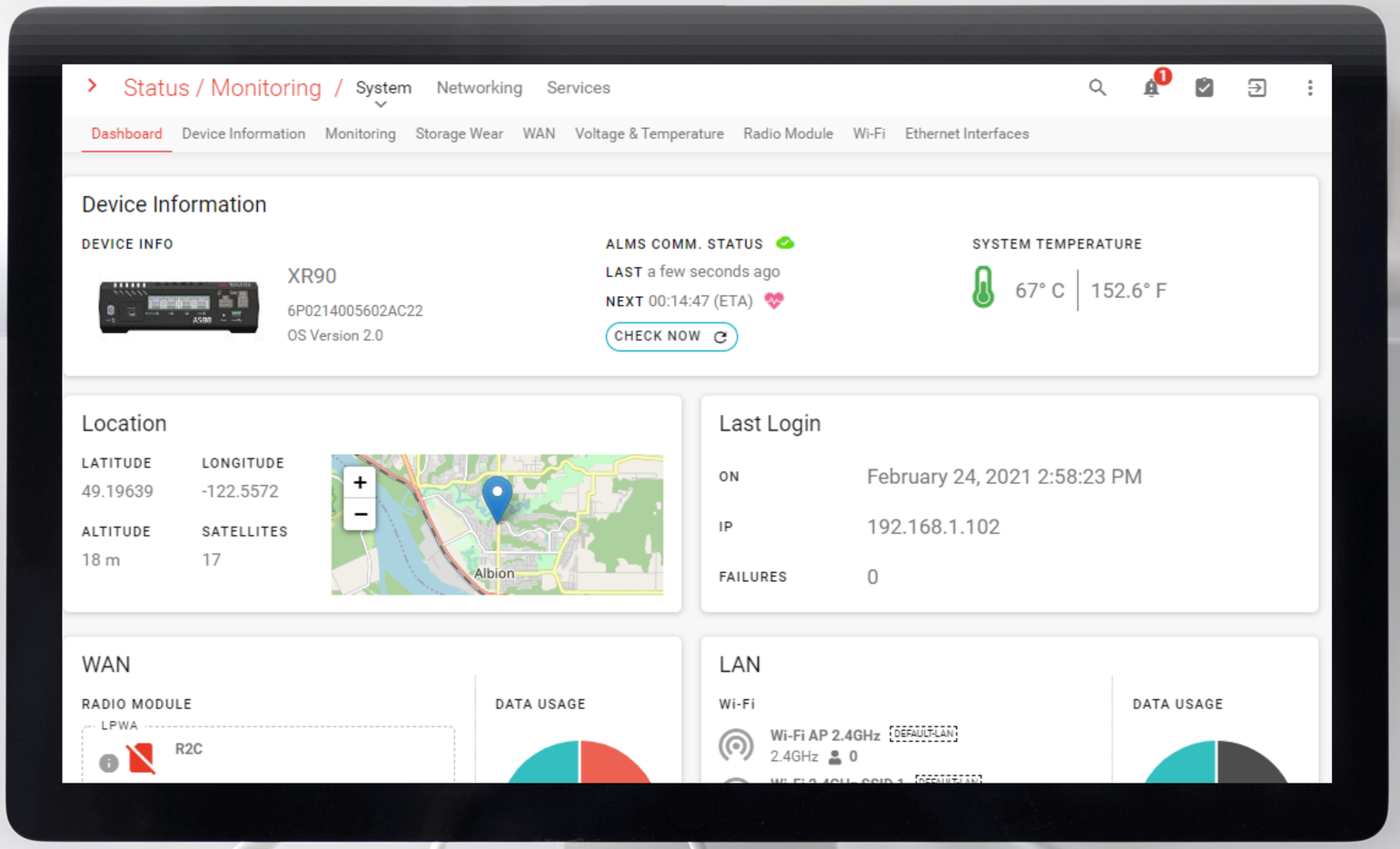


SPECIFIC STATUS INFORMATION

Using the Dashboard

Using Other Parts of Status/Monitoring

Specific Configuration Settings

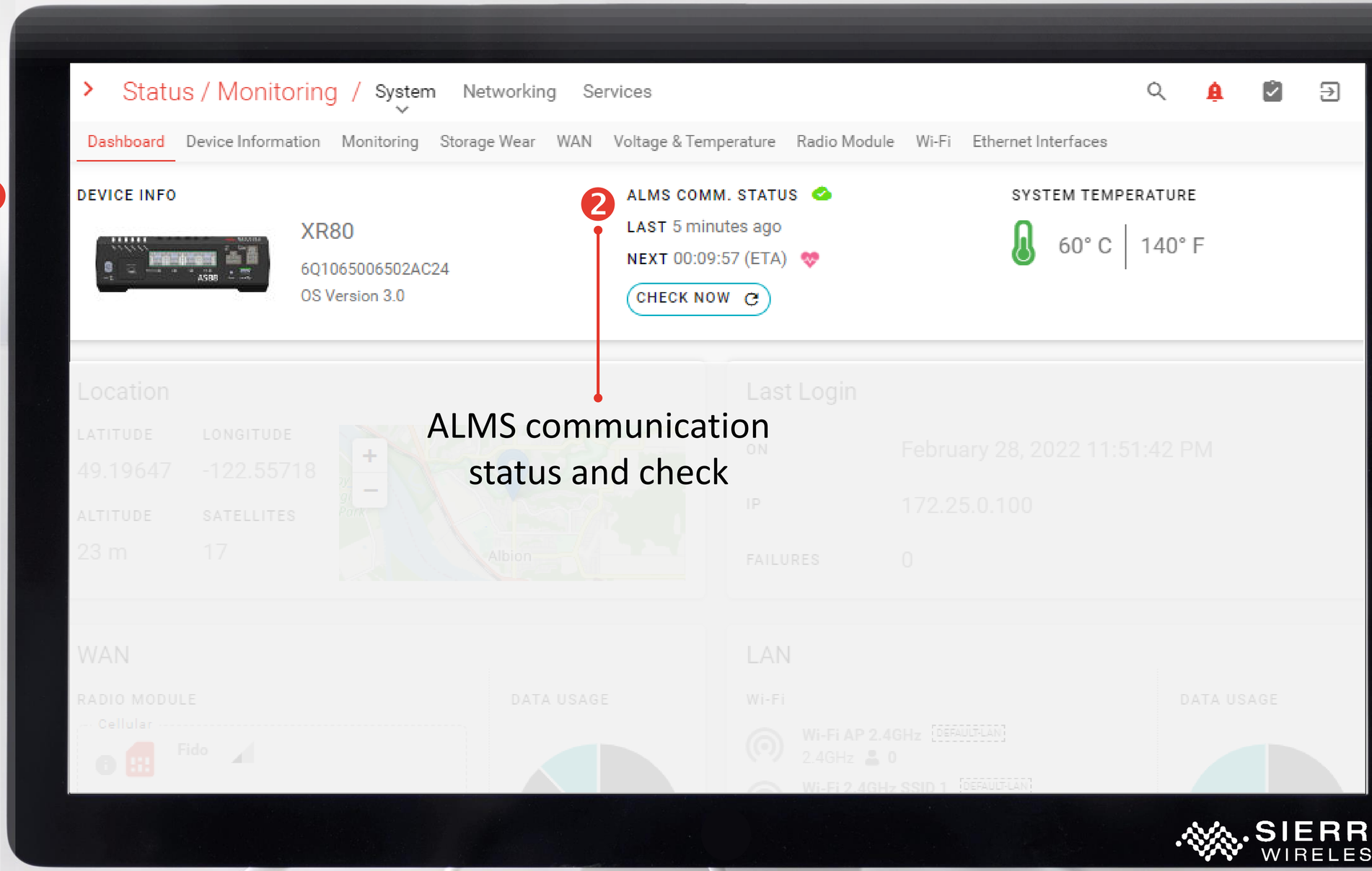


Dashboard

XR SOLUTION ADMINISTRATOR

Device model, serial number, AOS version

1

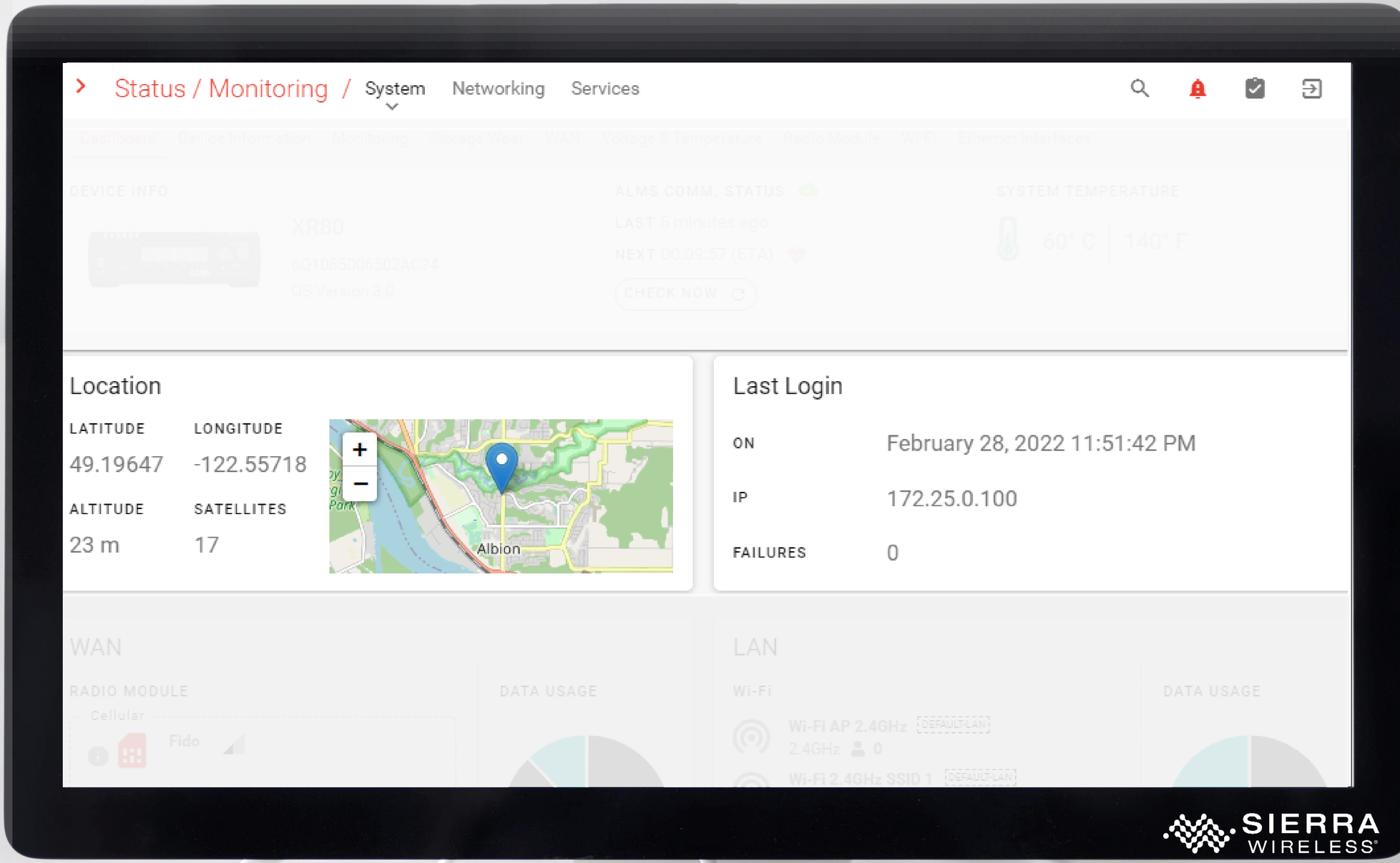


ALMS communication status and check

SIERRA WIRELESS

Dashboard

Location details ❸
(implies working status)



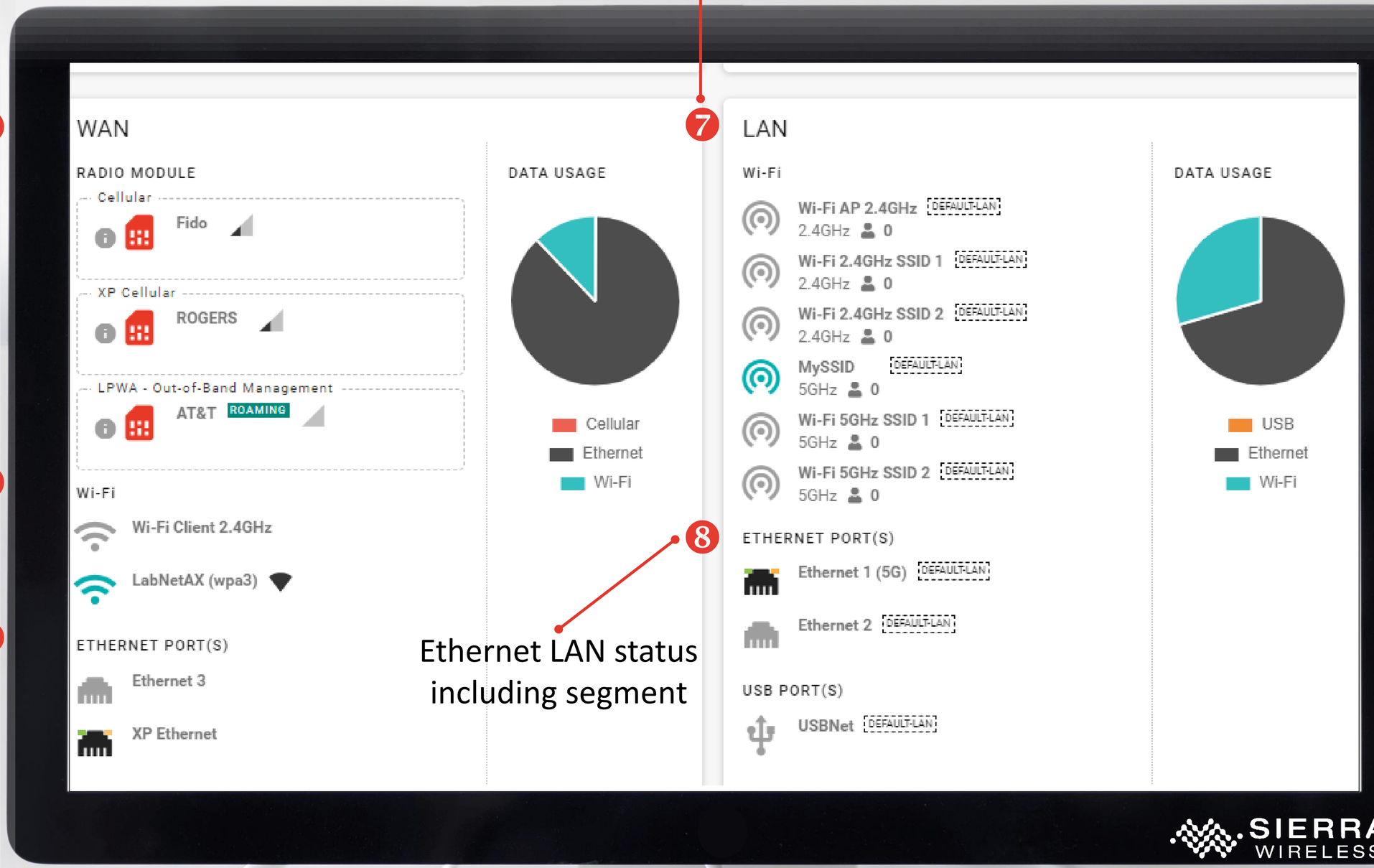
Dashboard

Wi-Fi AP status including SSID, client count, segment (Bridge)

Cell network status hover over the “i” 4

WAN Wi-Fi (STA) status 5

Ethernet WAN status 6



8 Ethernet LAN status including segment

Status Information Apart from the Dashboard

Question	Where to look
Is my Cell link connected?	Status* > System > Radio Module > Cellular : Adapter Status
Is my Station Wi-Fi connected?	Status* > System > Wi-Fi : Clients : States
Is my GPS/Location working?	Status* > Services > Location
Is my VPN connected?	Networking > VPN > IPsec Tunnels : Status (Dashboard in 4.0)
Am I reporting to ALMS?	System > ALMS > LWM2M (changed in 4.0)
Is my Wi-Fi broadcasting?	Status* > System > Wi-Fi : Wi-Fi AP
How many clients are connected?	Status* > Networking > Neighbor

Status* is used as a short form for Status / Monitoring

Specific WAN Link Details

Question	Where to look
Will this link support IPv4, IPv6 or both?	WAN table (Status* > System > WAN)
What is my current IP address on a specific link?	WAN table (Status* > System > WAN)
What DNS servers are being used on a specific link?	WAN table (Status* > System > WAN)
What link is currently used for traffic?	Multi-WAN table (Status* > Networking > Multi-WAN)
What phone number is associated with a given cellular link?	Radio Module status (Status* > System > Radio Module)
Am I connected on 5G?	Radio Module status (Status* > System > Radio Module)
What channel is my Wi-Fi using?	Wi-Fi status (Status* > System > Wi-Fi)

Status* is used as a short form for Status / Monitoring

BASIC CONFIGURATION SETTINGS

Definition of Basic Settings

Procedures for Each Setting

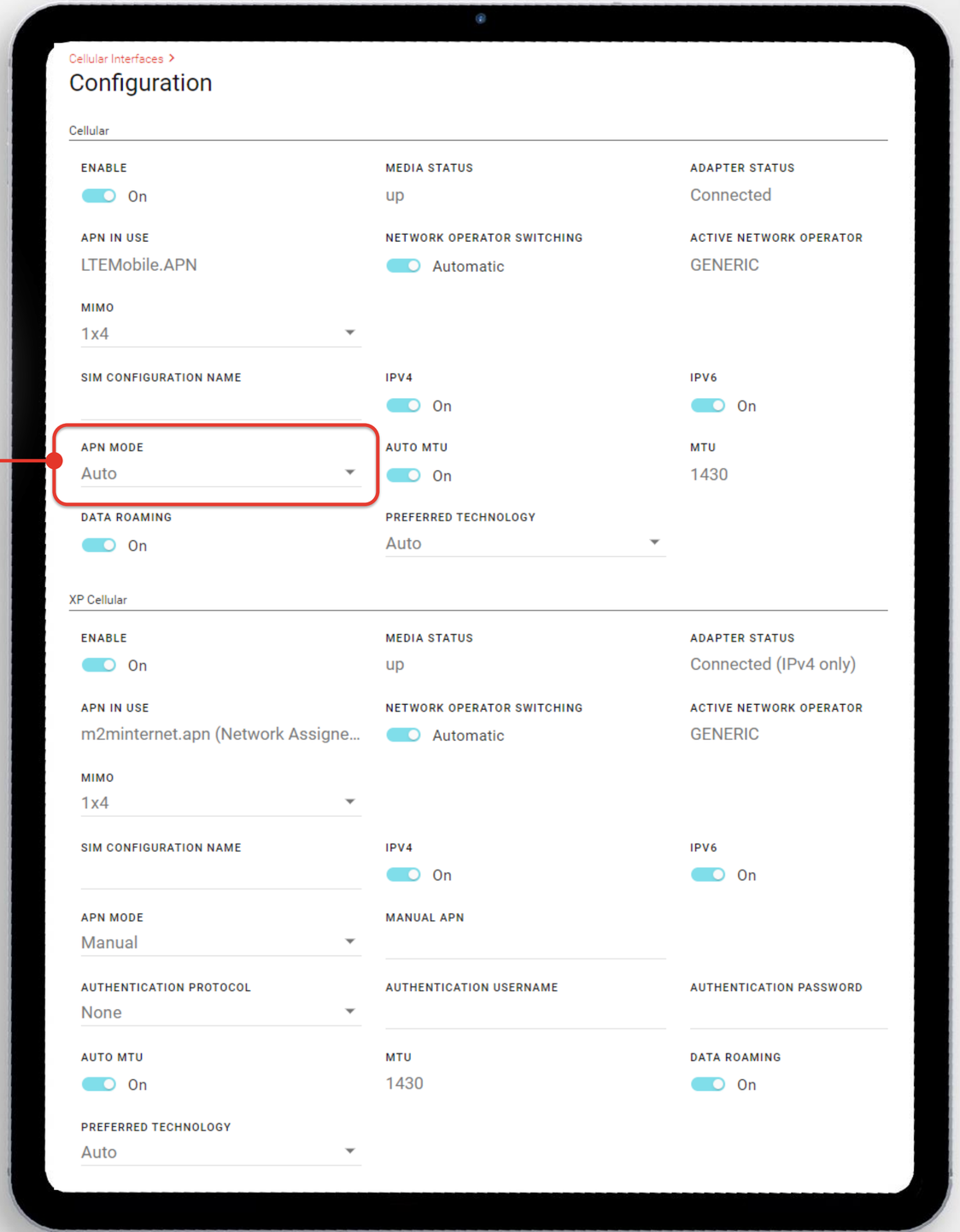
AirLink OS Basic Configuration Settings

Things you should be able to do in AirLink OS:

- Change a Cellular APN
- Change LAN addressing
- Set up Wi-Fi Station (client) profile
- Set up Wi-Fi Access Point (SSID, security, band)
- Set router shutdown (time, voltage)
- Set up location reporting to CAD

Cellular APN

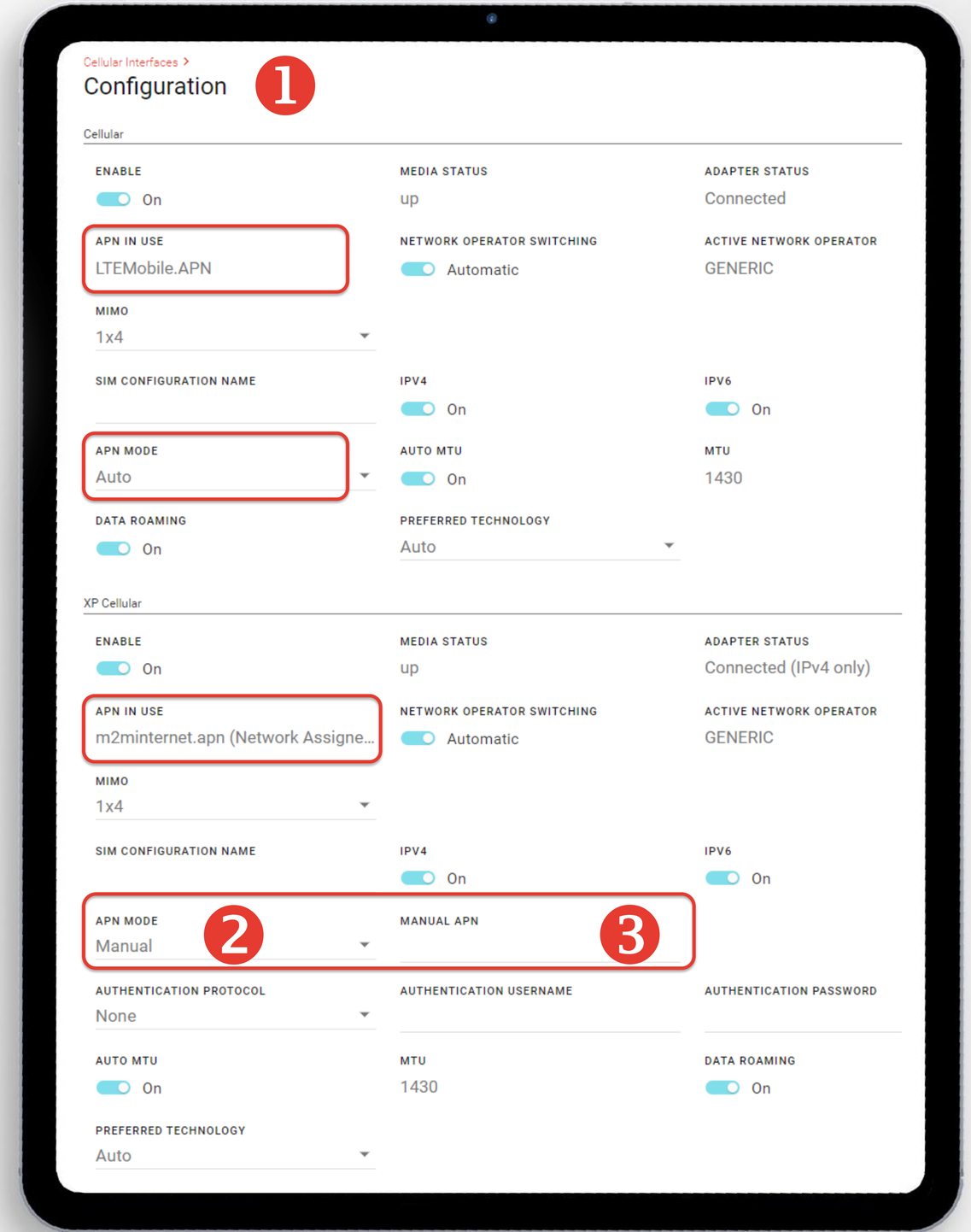
"Auto" APN mode determines the Primary Operator and uses a look-up table to provide the most common APN.



Cellular APN

To provide a different APN:

1. Go to **Hardware Interfaces** > **Cellular Interfaces** > **Configuration**
2. Change **APN Mode** to Manual
3. Do one of the following:
   a. Enter the **Manual APN** provided
   b. Leave the **Manual APN** blank to query the network to provide a suitable APN

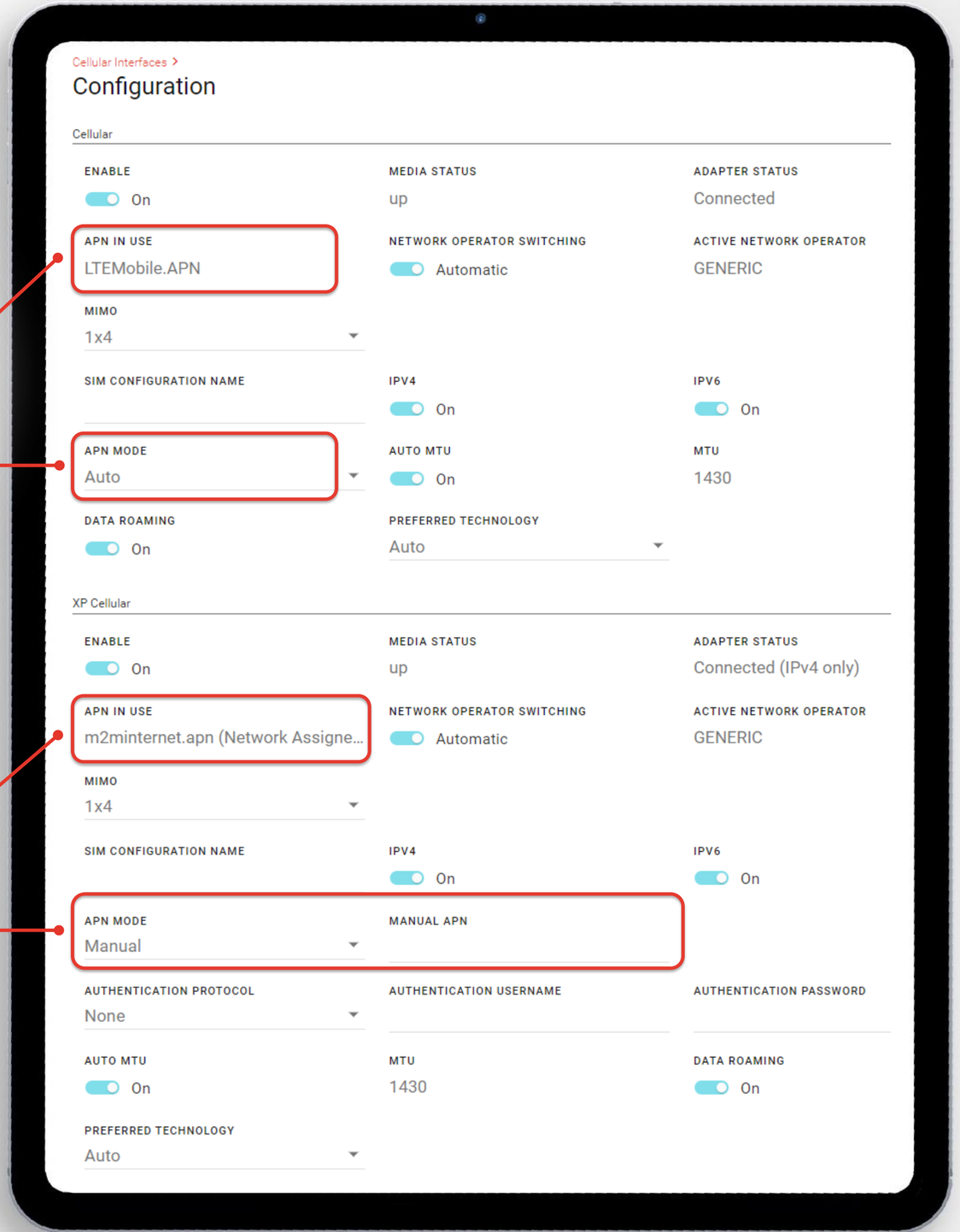


Cellular APN

This example shows

One instance where the Auto APN is working

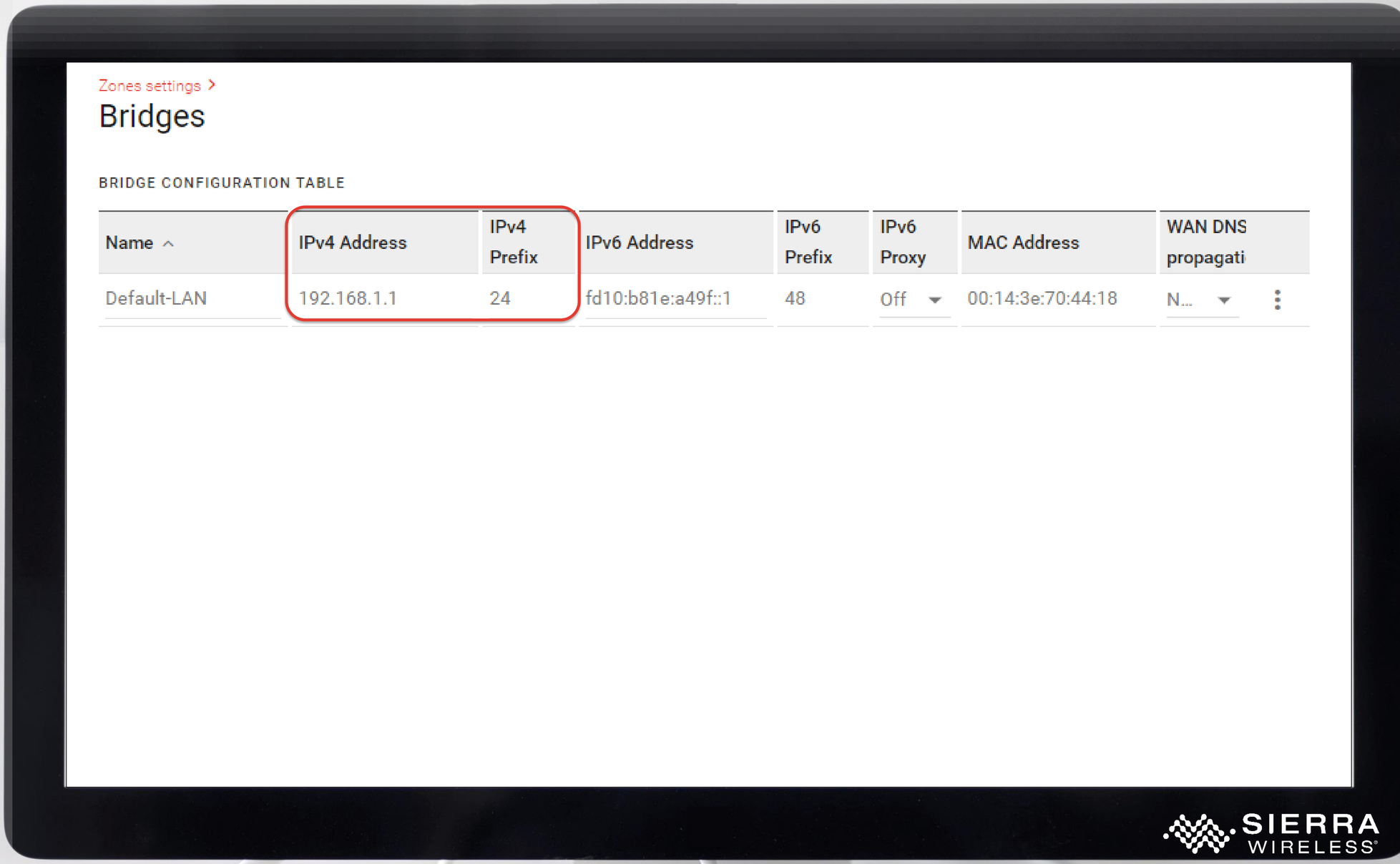
One instance where an APN is assigned by the network



Change LAN Addressing

Set by default to:

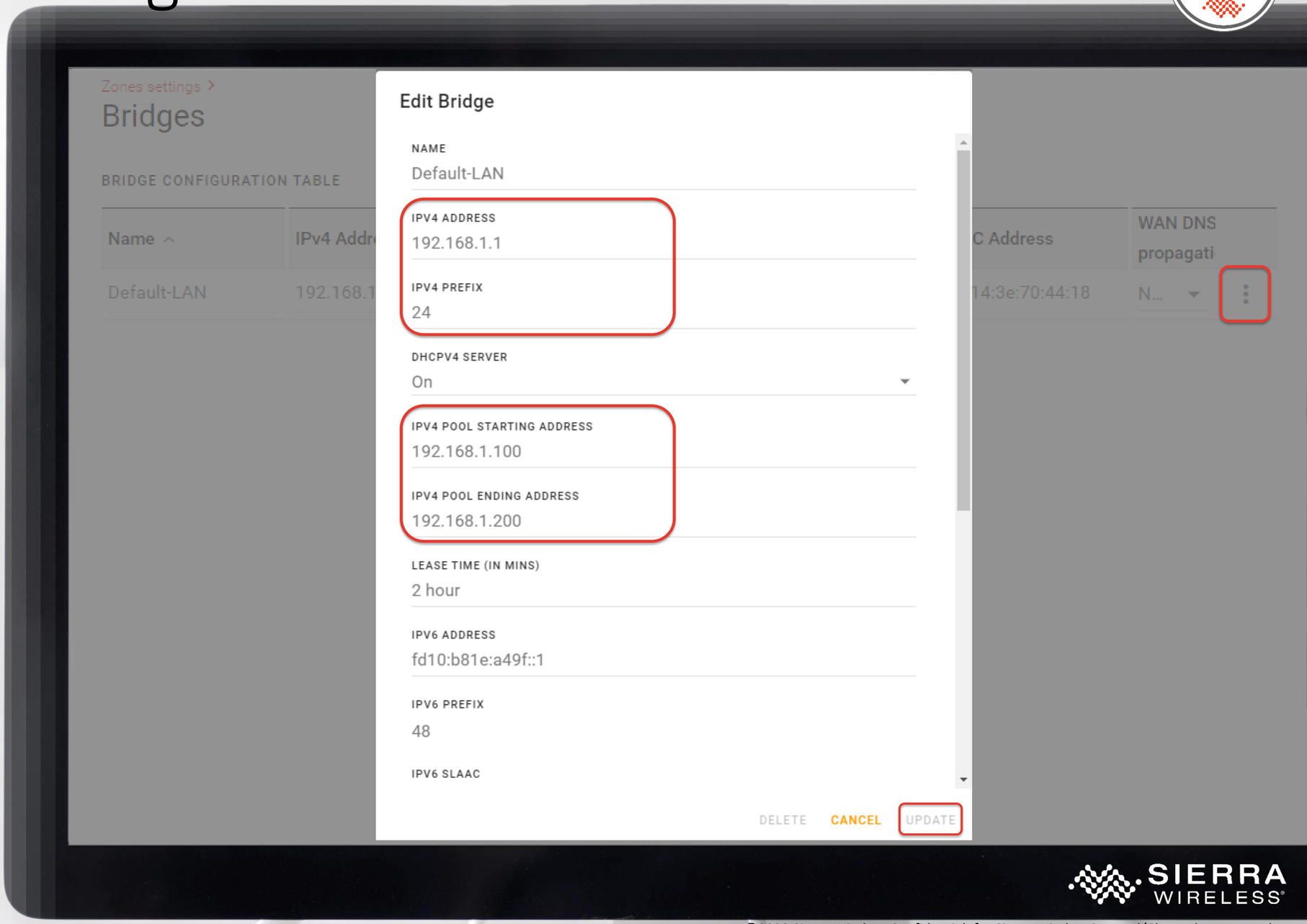
- 192.168.1.1 (Default Gateway)
- 192.168.1.0/24 (Network)



Change LAN Addressing

To change the addressing of the Default LAN:

1. Go to **Networking** > **Zones settings** > **Bridges**
2. In the **Bridge Configuration Table** click the three dots
3. Provide the new intended IPv4 address and prefix
4. Provide the new DHCP starting and ending addresses
5. Click **Update** to save and take effect immediately

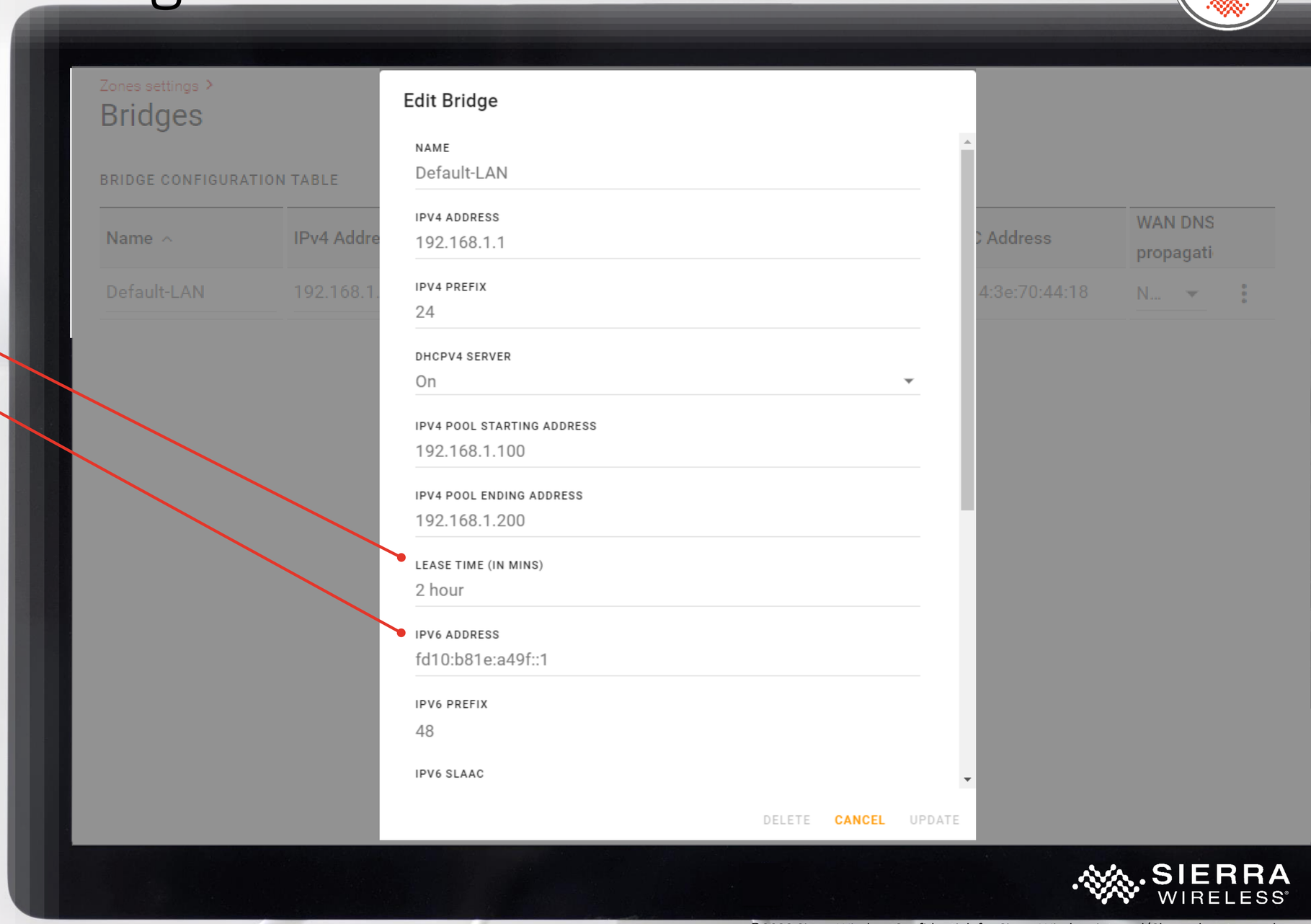


Change LAN Addressing

There are other settings that you can change including:

- DHCP **Lease Time**
- All IPv6 properties

but nothing further is required change the addressing of the existing IPv4 Default LAN



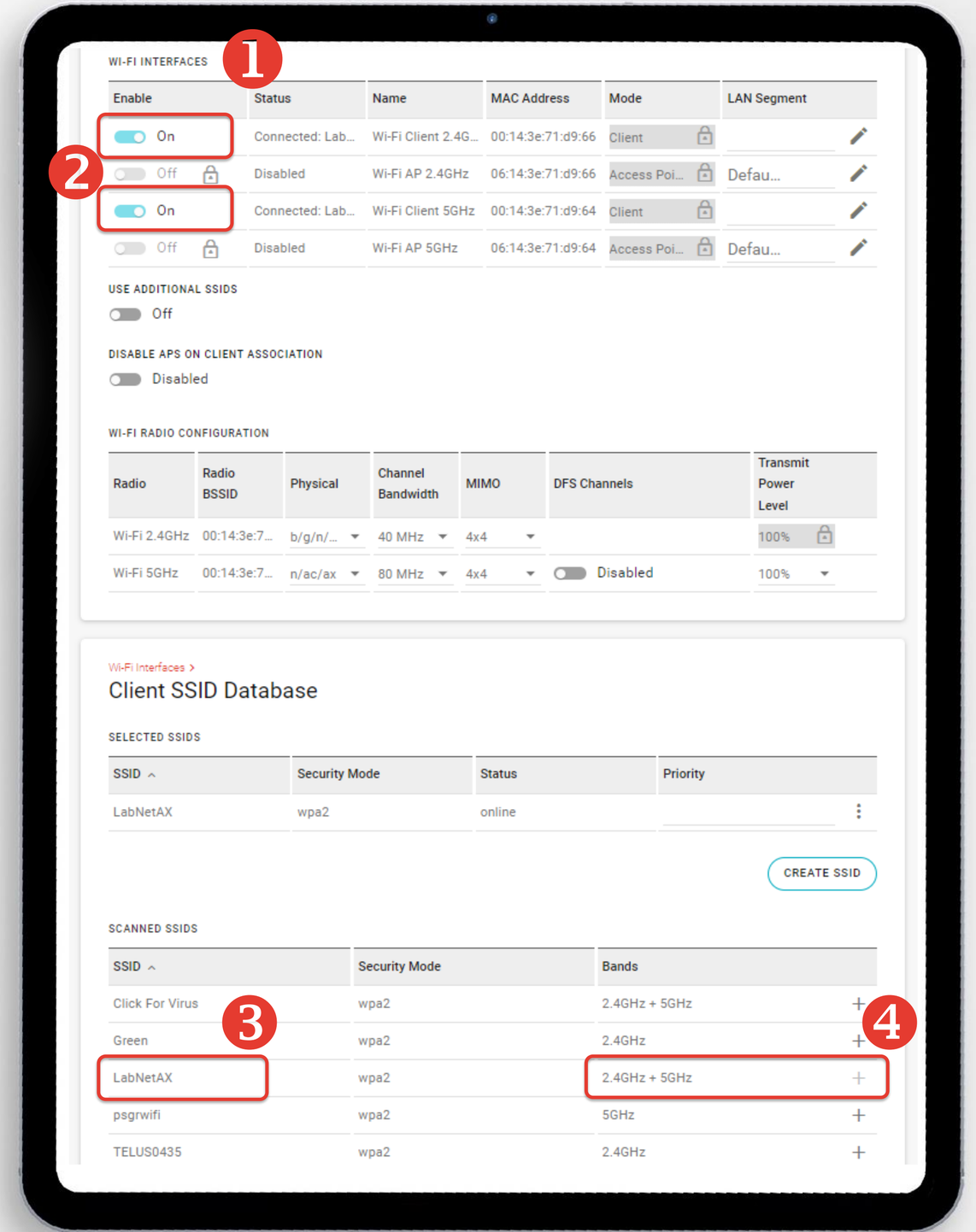
Set Up WAN/STA Wi-Fi

Recommended workflow:

1. Go to **Hardware Interfaces** > **Wi-Fi Interfaces**
2. Enable the 2.4 and/or 5GHz clients
3. Look for desired SSIDs in the **Scanned SSIDs** table
4. Click the **+** button for all desired SSIDs and enter the password

   This was improved in 4.0.

   Those SSIDs will be written to the Client SSID Database and used by the radio(s) to connect right away.



If you do not see an expected Wi-Fi network

Channels available for outdoor use vary by country

XR Series routers are currently locked down by region

DFS channels are disabled by default

The XR Series have been certified as outdoor-use routers.

This limits the available 5GHz Wi-Fi channels

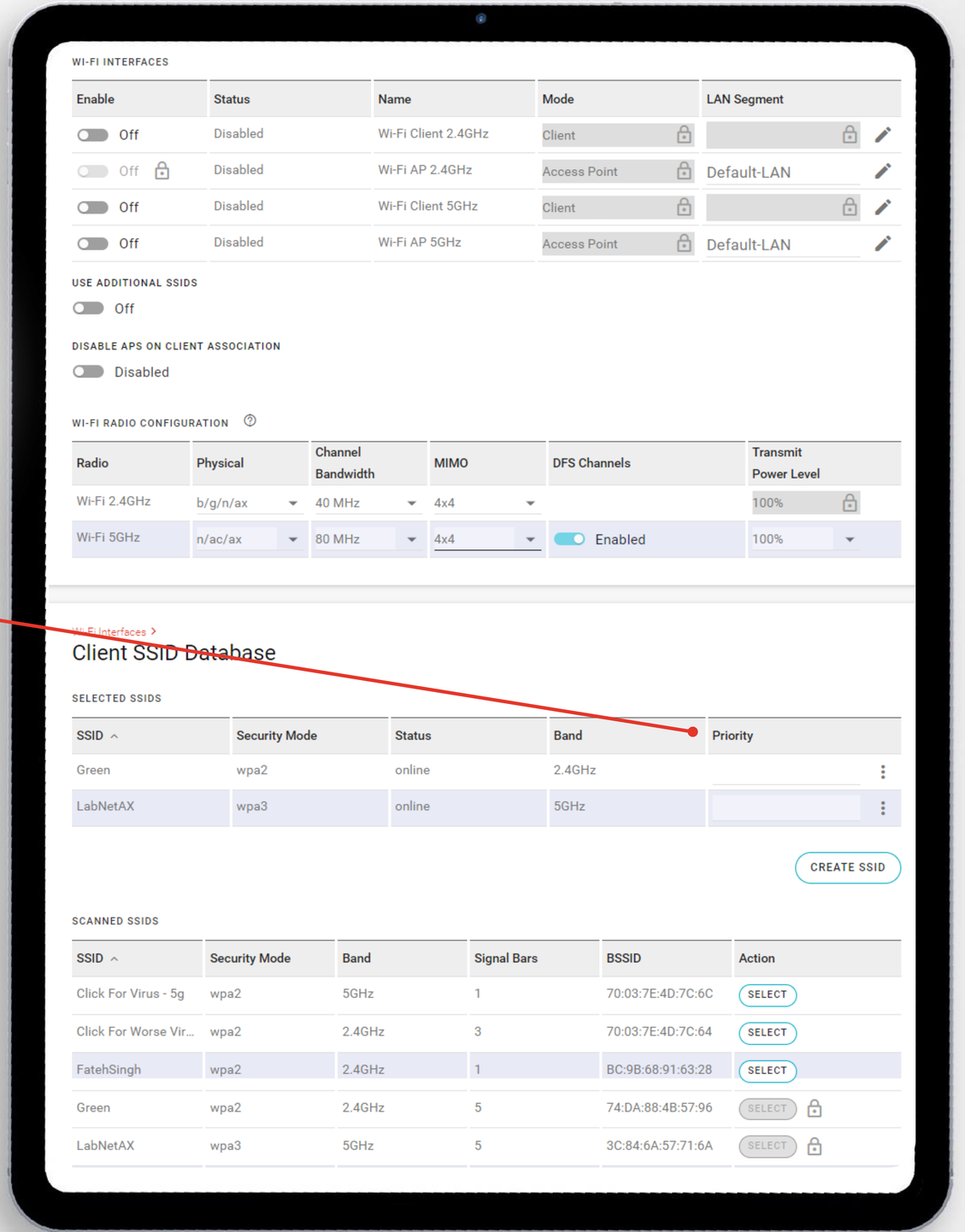
DFS channels require special handling to ensure they do not interfere with radar installations

Set Up WAN/STA Wi-Fi

Any available STA network will automatically be joined.

If there are multiple profiles for a single band, the first profile found connects.

Use **Priority** to rank multiple networks in the desired order.

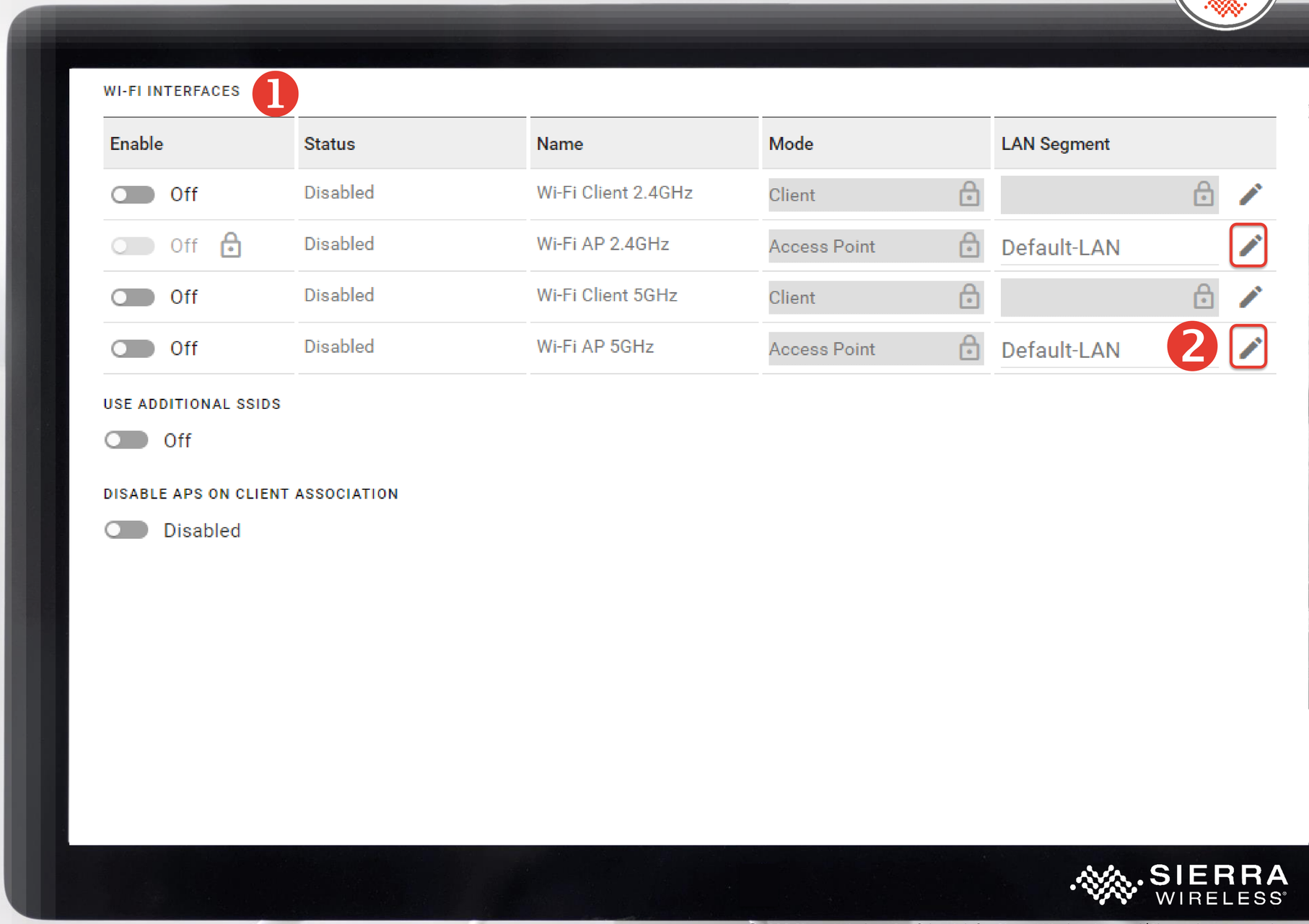


5GHz STA will be preferred over 2.4 STA for traffic

Set Up Wi-Fi Access Point

Recommended workflow:

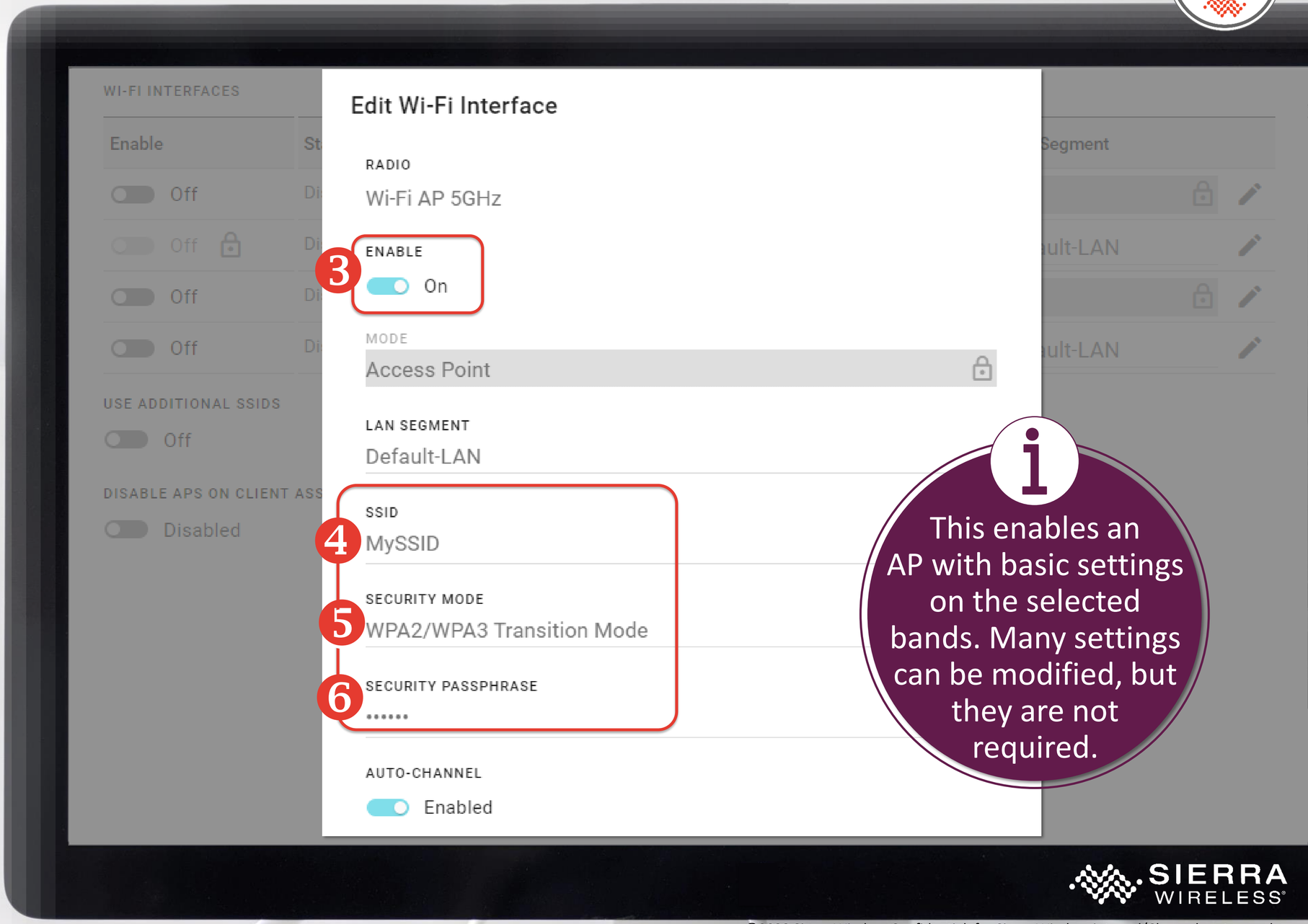
1. Go to **Hardware Interfaces > Wi-Fi Interfaces**
2. Click on the pencil for the 2.4 and/or 5GHz Access Points. (The **Edit Wi-Fi Interface** screen appears.)



Set Up Wi-Fi Access Point

Recommended workflow:

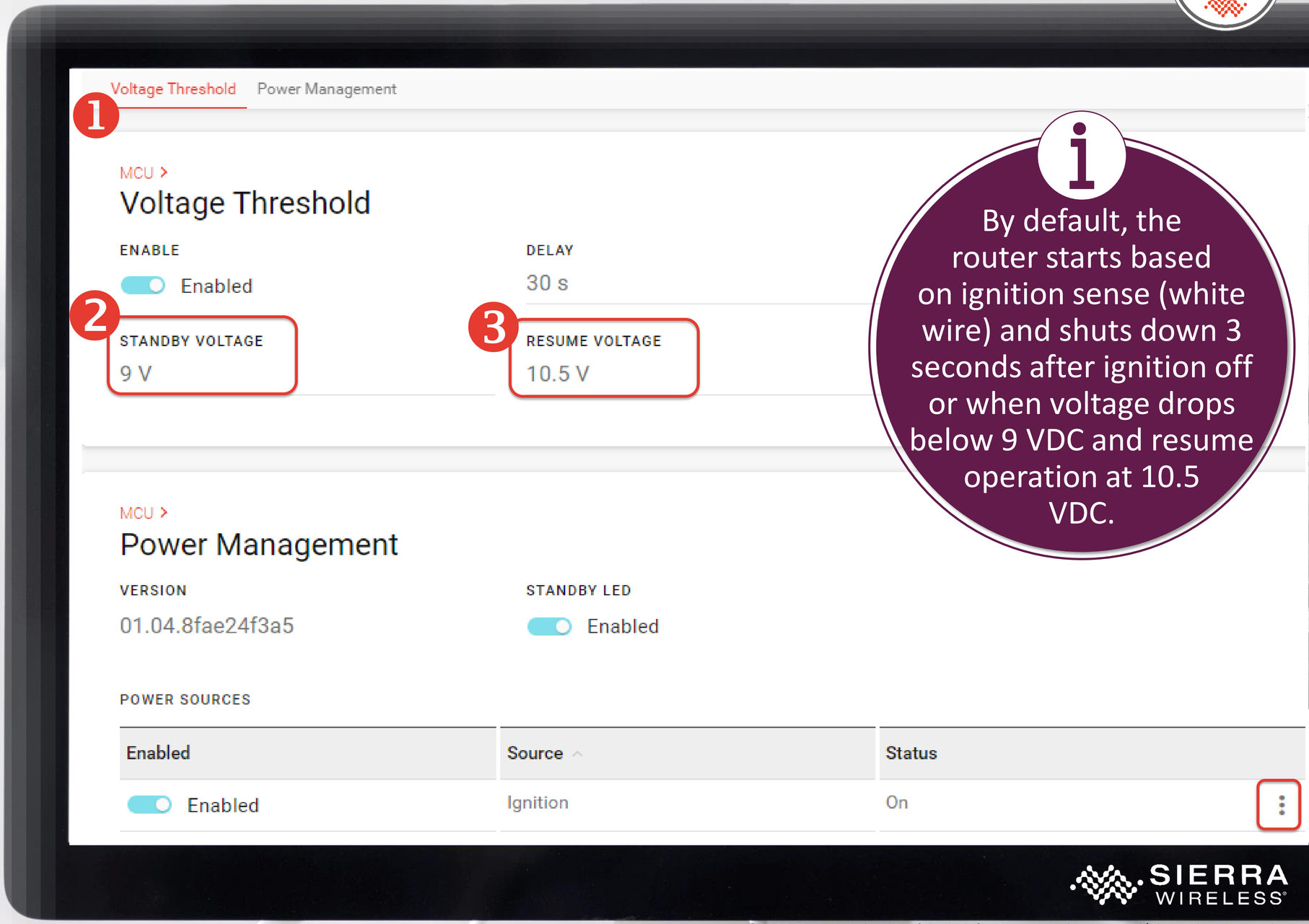
3. Click **Enable**
4. Enter your preferred **SSID**
5. Select the desired **Security Mode**
6. Enter the passphrase
7. Click **Update** to save and enable



Set Up Router Shut-Down

To change the shut-down thresholds:

1. Go to **System** > **MCU** > **Voltage Threshold**
2. In the **Standby Voltage** field, enter the voltage at which to shut down
3. In the **Resume Voltage** field, enter the voltage at which the router should start up again
4. Under **Power Management**, in the **Power Sources** table, click on the three dots on the Ignition line

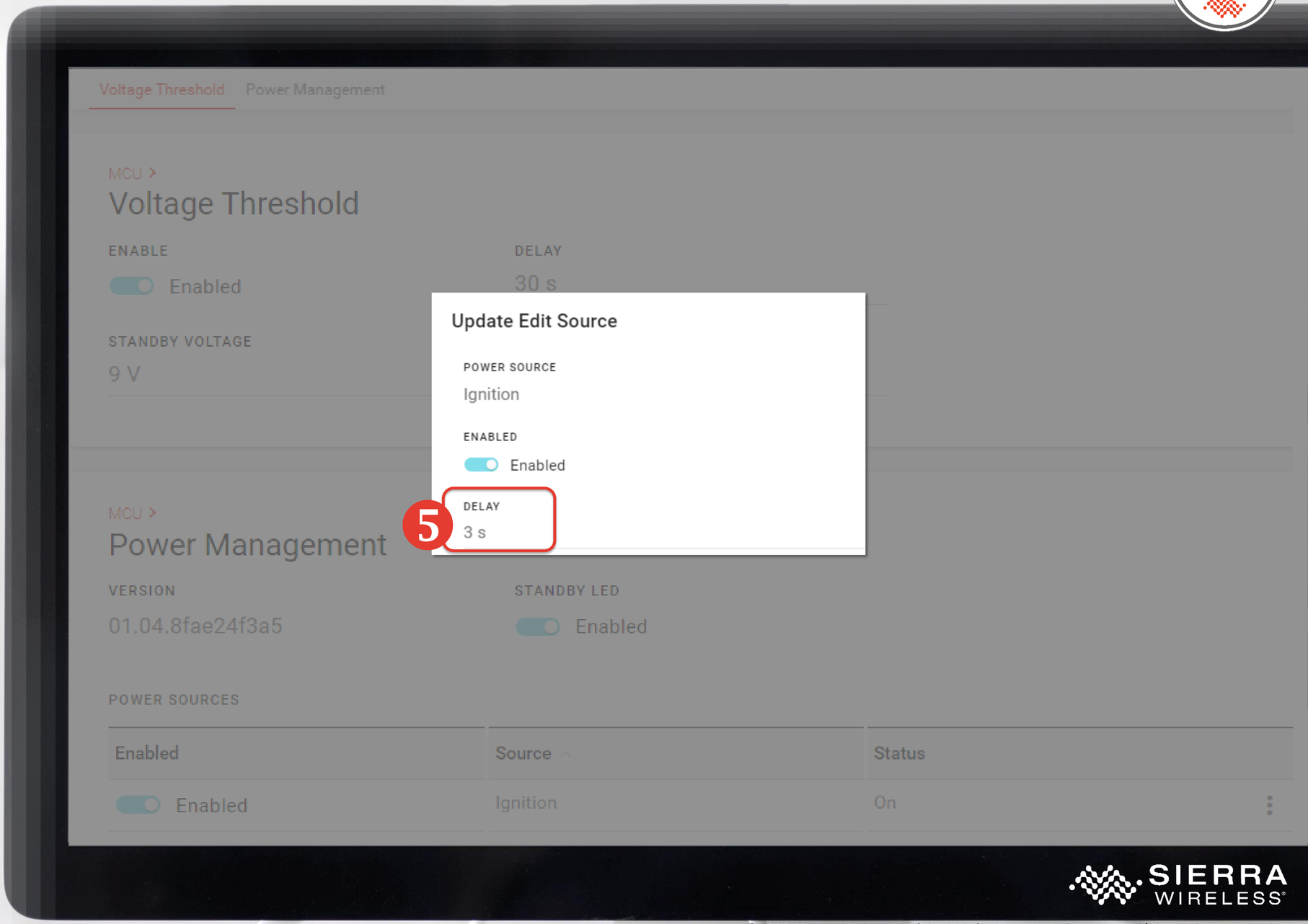


By default, the router starts based on ignition sense (white wire) and shuts down 3 seconds after ignition off or when voltage drops below 9 VDC and resume operation at 10.5 VDC.

Set Up Router Shut-Down

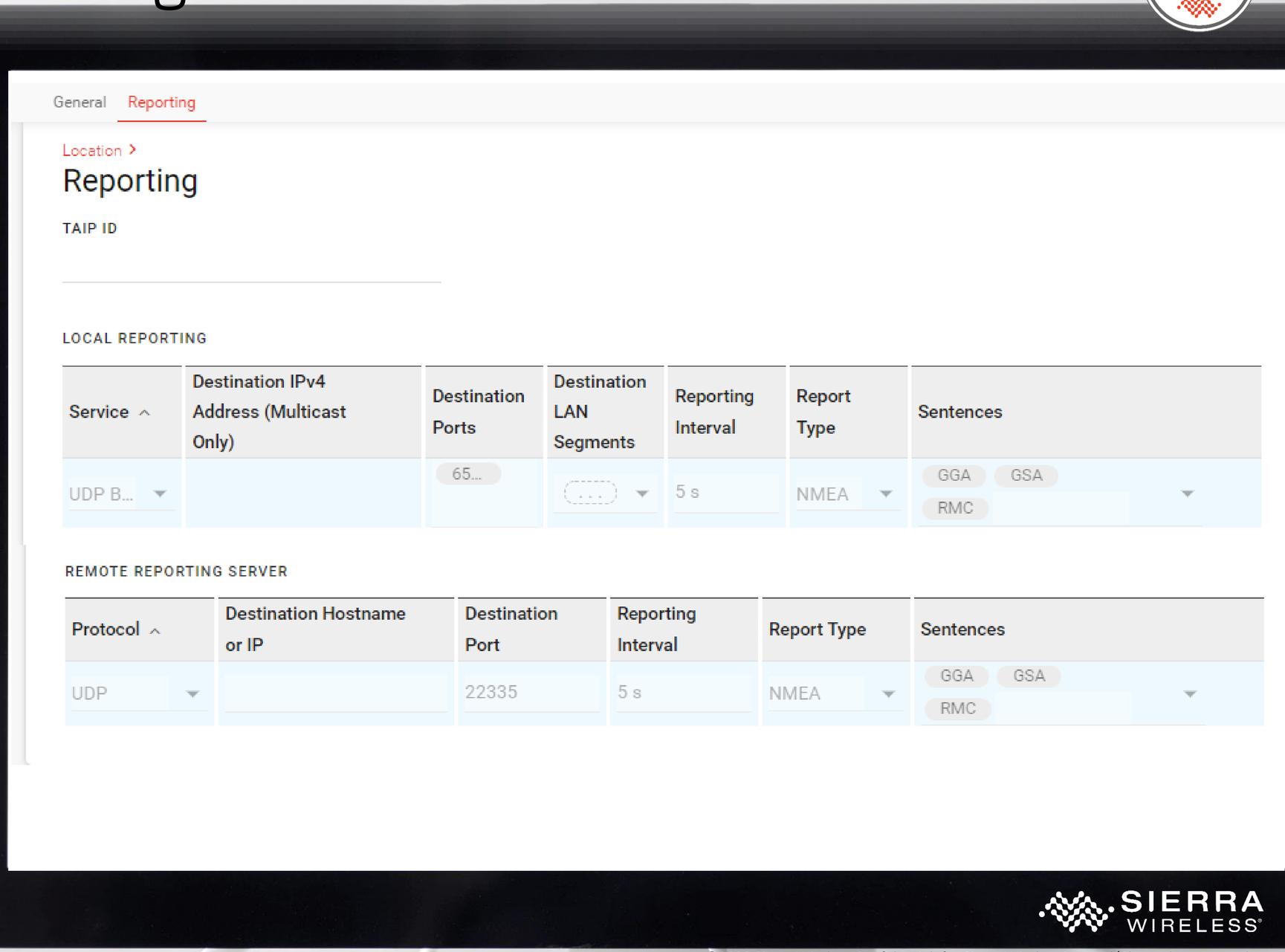
To change the shut-down thresholds:

5. In the **Update Edit Source Delay** dialog box, type the number of seconds the router should maintain operation after ignition off



Set Up Location Reporting

Location services are enabled by default, but you need to be able to specify certain details to set up CAD/AVL reporting for an end user.



Set Up Location Reporting

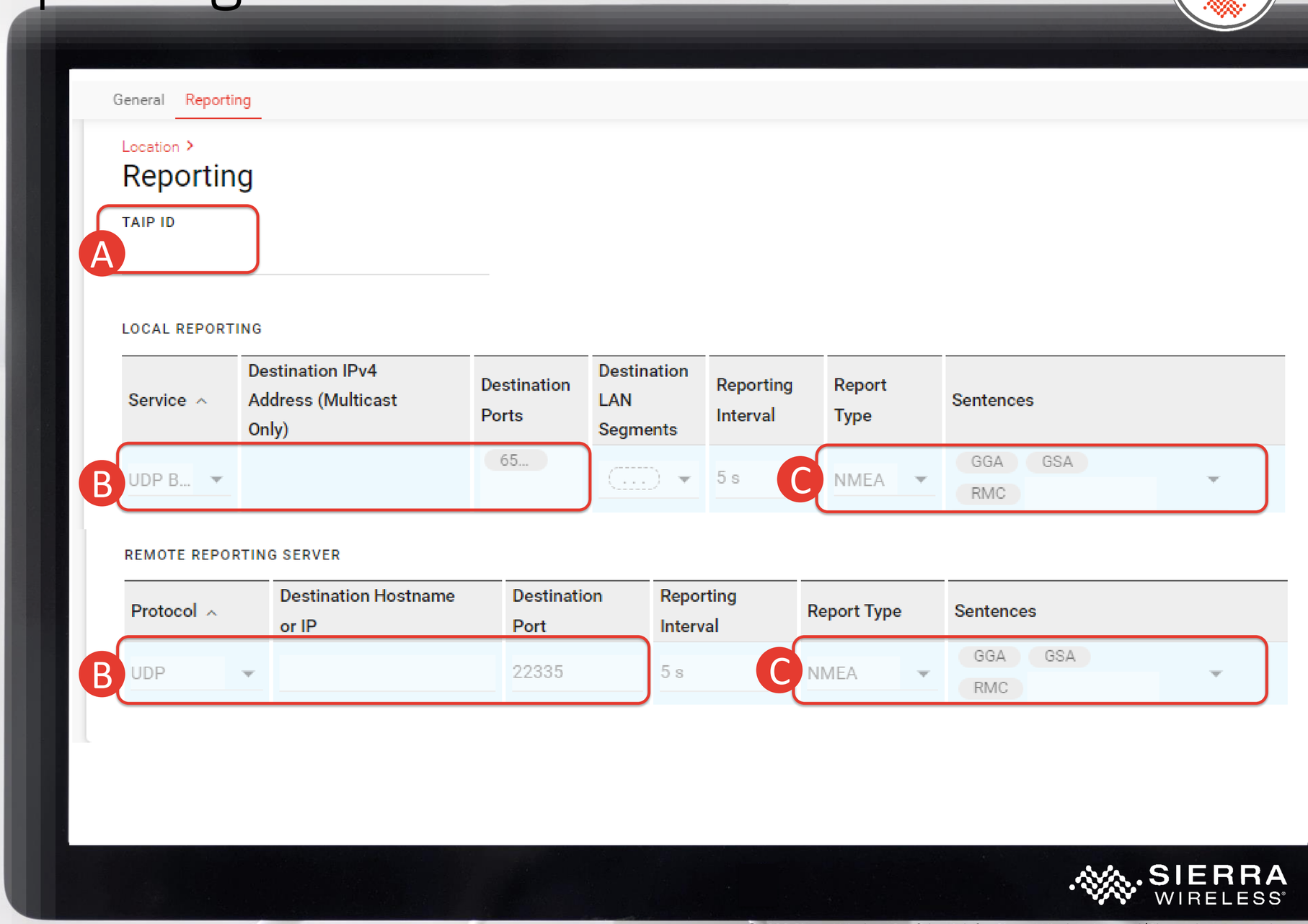
To set up location reporting, you need to know:

A. TAIP ID
(optional, if using TAIP)

B. Reporting target (local or remote address, including network ports)

C. Protocol and sentences

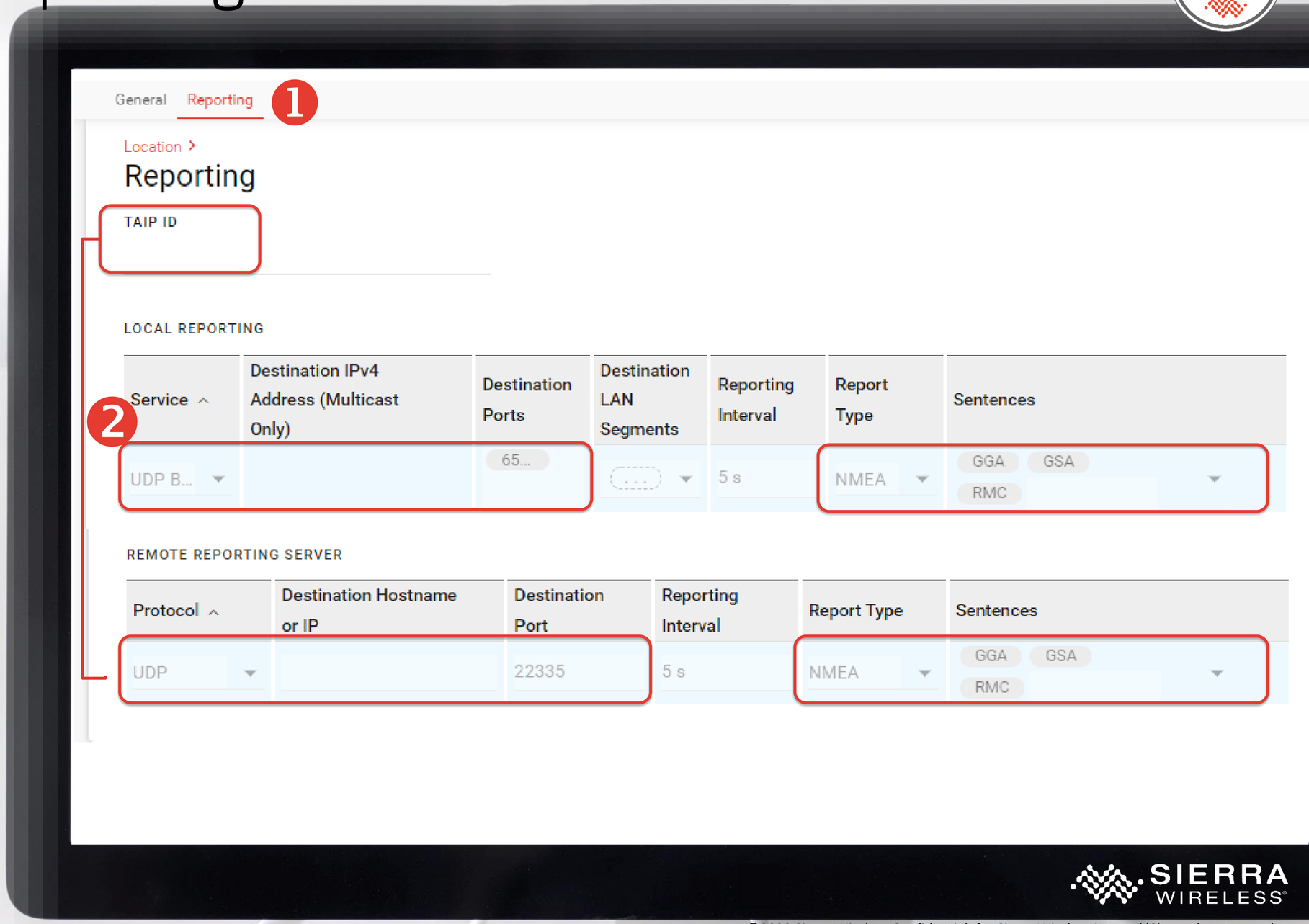
The XR Series support TAIP and NMEA reporting to network locations, remote or local.



Set Up Location Reporting

To set up CAD/AVL reporting:

1. Go to **Services** > **Location** > **Reporting**
2. Provide the details according to the information available.



Future releases or AirLink OS will include additional options.

WORKING WITH TEMPLATES:
ON ROUTER AND IN ALMS

About AirLink OS Templates

Modes for Creating Templates

When to Use Each Mode

What You Can Do with Templates, and From Where

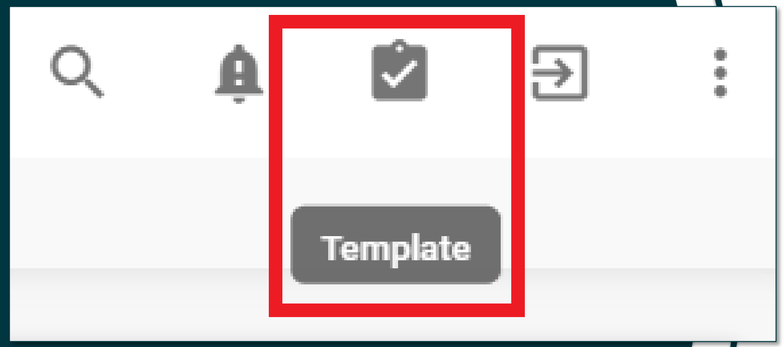
What you can do	Locally	From ALMS Configuration view	From ALMS Develop > Templates
Create a complete template from router	Yes	Yes	Yes
Create a partial template	Yes	Yes	Yes
Save a template to local file	Yes	Yes	No
Save a template to ALMS account	No	Yes	Yes
Modify a template	Yes	Yes	Yes
Load a template from local file	Yes	Yes	No
Apply an ALMS account template	No	No	Yes
When we will cover	This week	Next week	

About AirLink OS Templates and **Passwords**

For security purposes, passwords are **not** normally saved in template files.

ALMS provides a workflow for secure mass deployment of passwords to routers, including unique password per router.

About AirLink OS Templates



Templates can be saved and loaded locally

JSON (XML format)

Different from ALEOS or MGOS

Template creation process has evolved:

Look and feel and capability

Last week's lab covered setting configuration parameters manually in sequence

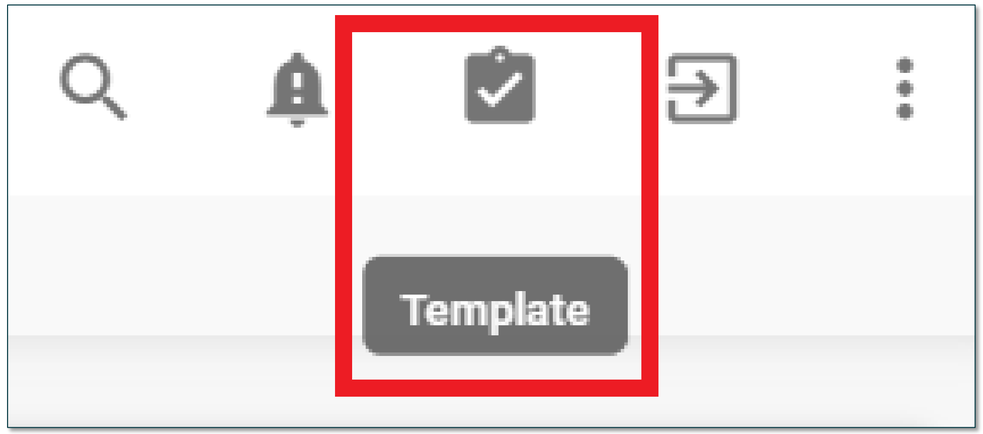
SIERRA WIRELESS

About AirLink OS Templates: Working Locally

Click the Clipboard/Checkmark icon to enter Template mode.

Local template creation is fine for prototyping and testing

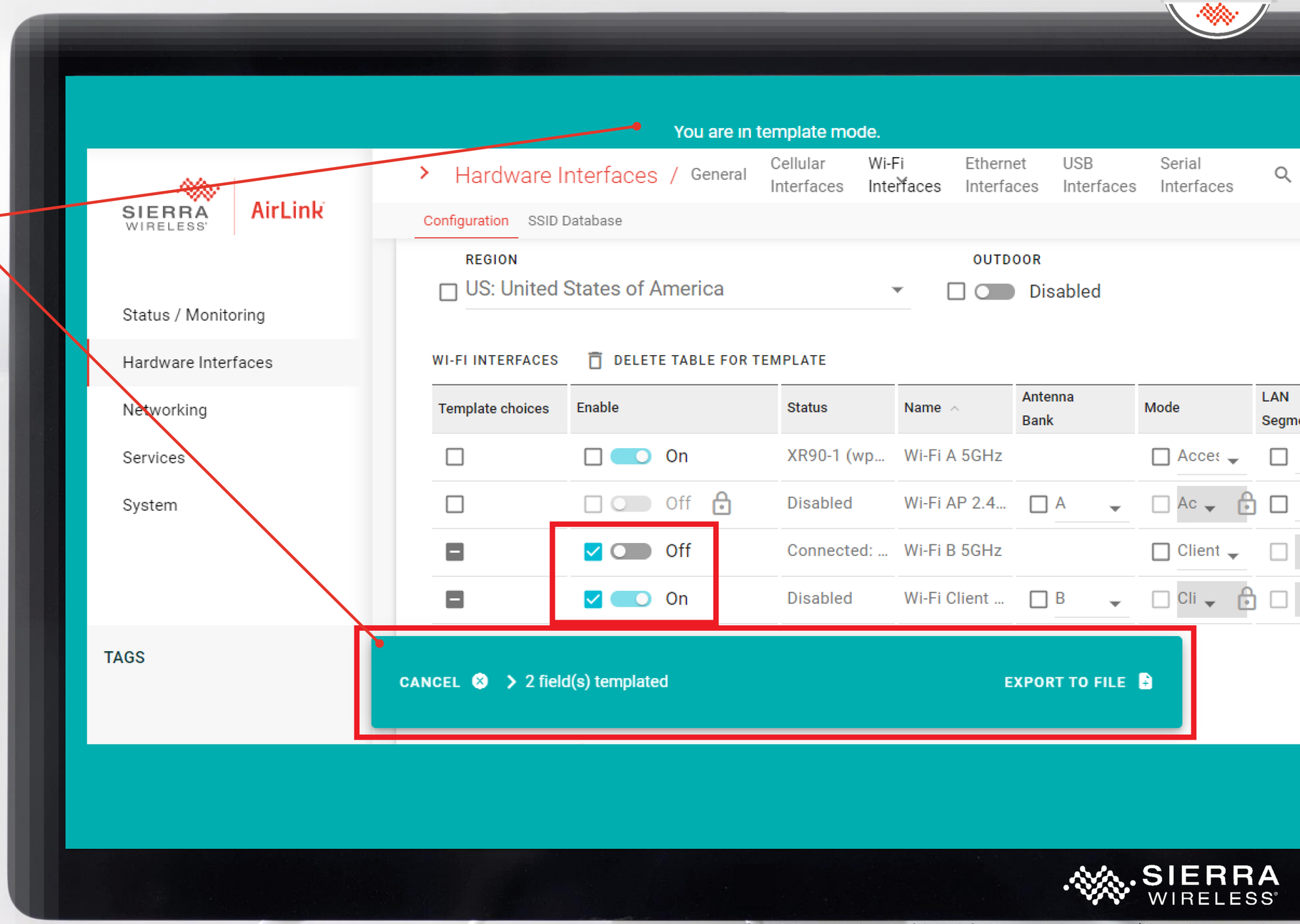
You can apply a template to a router and then enter Configuration mode through ALMS to save a template for mass deployment



There are new tools for creating and working with templates locally and within ALMS

Template Mode

Template mode in AirLink OS is clearly indicated by bright blue frame and bar



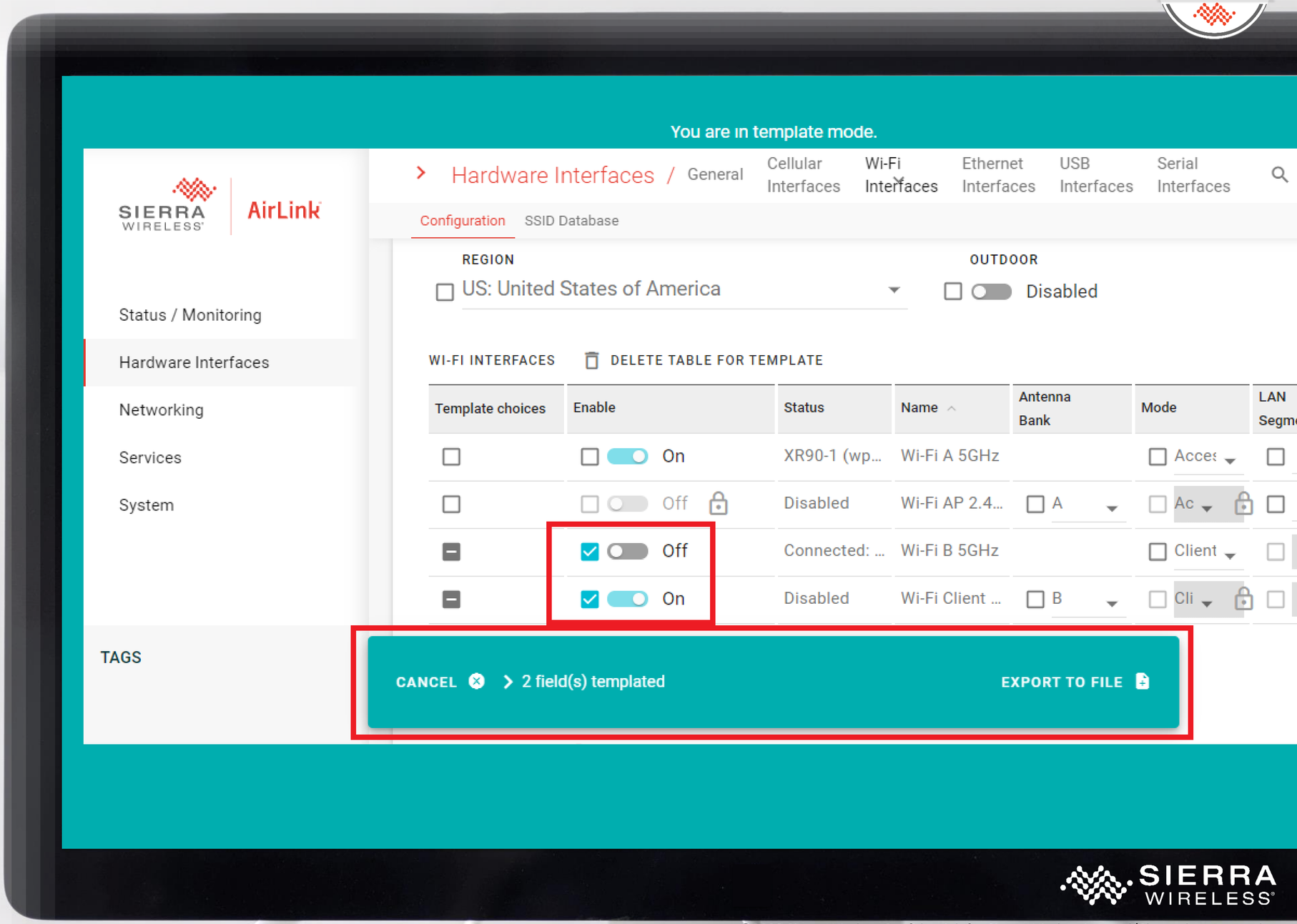
Template Mode

Changes are not applied to the system while you are creating the template

Working locally on the router, templates can only be saved to a local file

Locally saved template can be:

- Reloaded locally and modified to add additional settings
- Loaded in ALMS Configuration view and saved to ALMS account for deployment

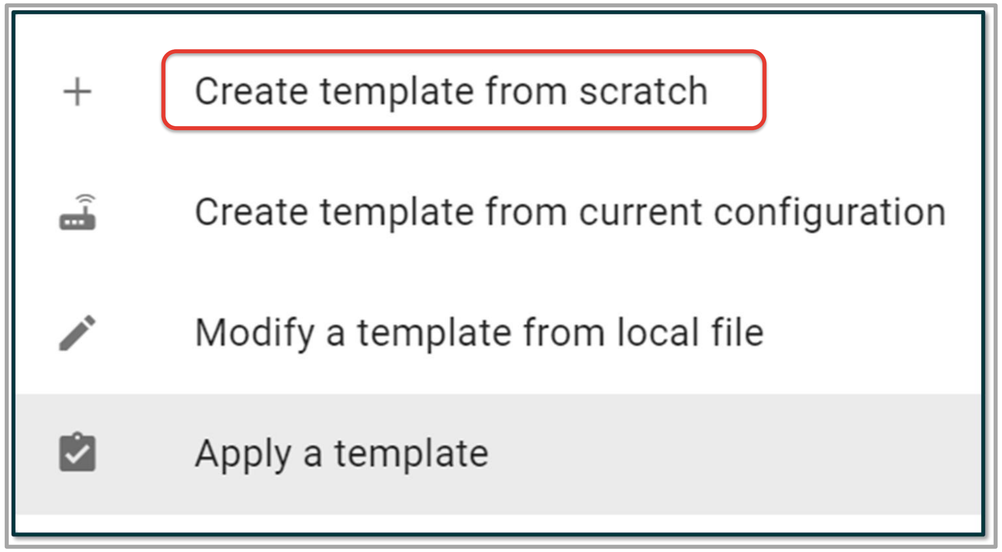


Mode 1: Create a Template from Scratch

Switches to Template mode and lets you specify and capture configuration changes

Capture settings two ways:

1. Choose settings already present on router
2. Make changes from the current configuration



Save changes when all template elements are captured

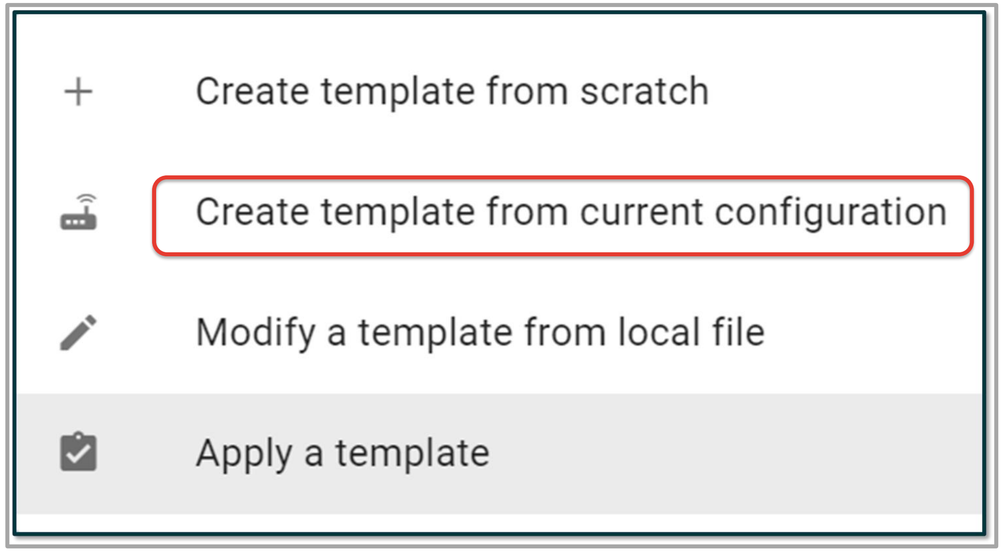
- Changes are not applied to the system
- *This is like creating a partial template, previously only available on management platforms*

Mode 2: Create a Template from Current Configuration

Used for a full device configuration

Similar to creating and saving a complete template in ALEOS or MGOS but with one significant difference: it only captures the **non-default** settings.

This feature may not work with engineering builds of AirLink OS.



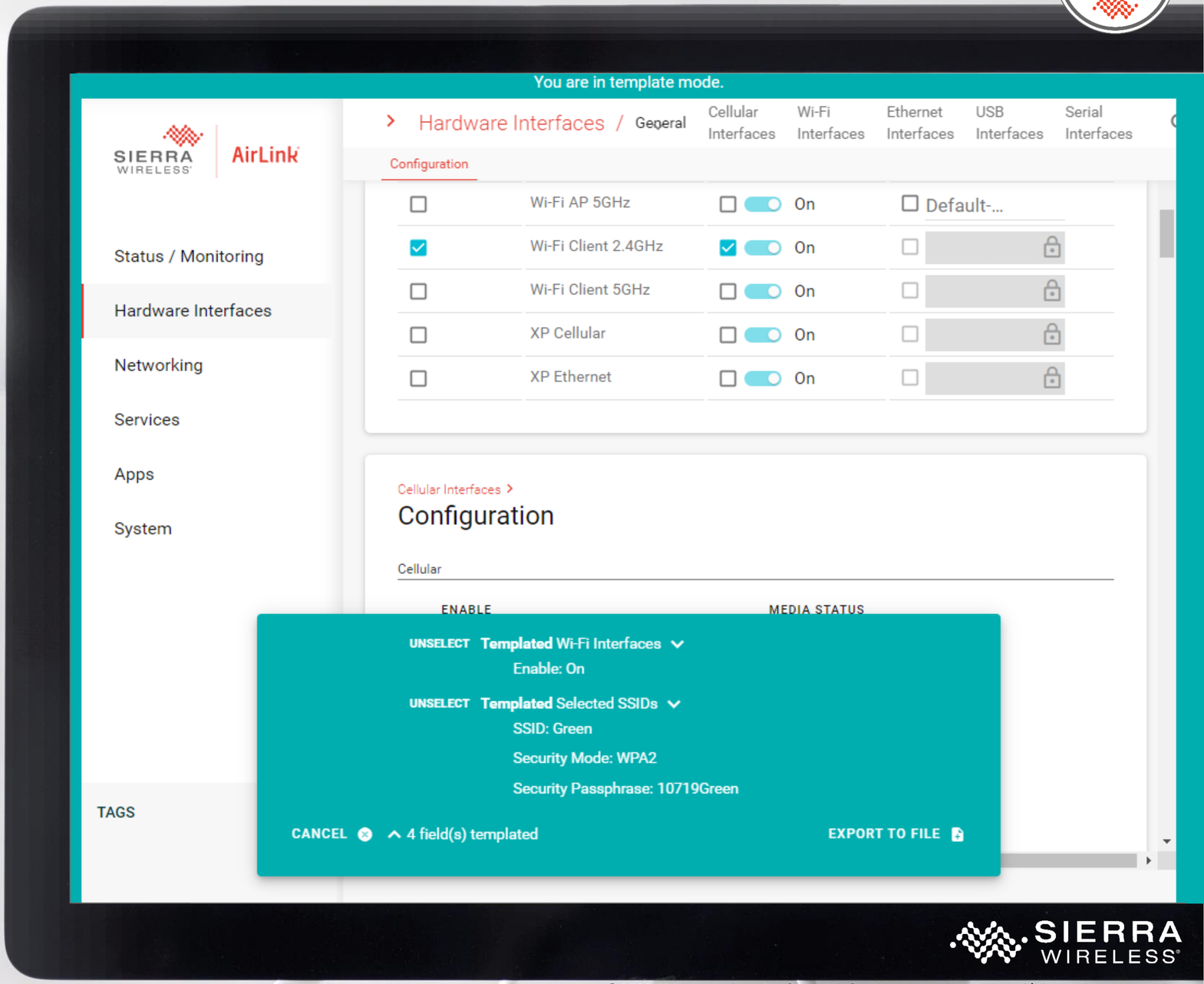
Mode 3: Modify a Template from a Local File

Very similar to **Create template from scratch**

Apply a saved template as a starting point and modify it by adding, removing, or revising changes

Existing elements of the template are clearly identified for easy access

A locally saved template must be re-saved within ALMS to be used for mass deployment



A template within a template

SIM template

Added in 3.1, enhanced in 4.0

There is now a specific SIM template within AirLink OS that must be used to set up connections that do not work using Auto APN mode.

Using PLMN (Primary Land Mobile Network) is recommended for SIM templates, but other options are available.

See the Q4/4.0 update training for full details of the SIM template.

WHAT’S NEXT

Knowledge Check

Online Quiz

Lab Exercise #2 and Submission

What You Should Know

XR SOLUTION ADMINISTRATOR

- What information is on what labels, and why
- Location of specific status information in AirLink OS:
  Link and interface states | Network states (LAN and WAN) | Current routing status | Subsystem states: location, CPU, temperature
- How to perform basic configuration settings
- How to create, save, and load templates locally
- How to perform basic operations

SIERRA WIRELESS

Introduction to Lab Exercise #2

In this lab exercise you will:

- Create and save a configuration template locally
- Perform a factory reset locally on the XR Series router
- Deploy a configuration template locally
- Perform a software upgrade locally (downloaded from Source)
- Back out of a software upgrade
- Capture log files locally
- Use network troubleshooting tools in AirLink OS
    - Ping
    - IP Capture in basic mode

Take the Online Quiz

As part of the certification program, you are required to demonstrate mastery of requirements to work with the XR Series routers

Complete the online quiz with >80% prior to the start of the next session

You do not need to complete the lab exercise prior to taking the quiz, because it is based on the presentation content

END OF SESSION 2

Thank you!