

Configuring URWB Radio Mode

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Configuring URWB Radio Mode

The wireless interfaces are configured to operate in a specific mode, or you can disable it. Once you configure the Radio mode, the device starts working as a Fluidity or Fixed infrastructure.

The following table shows the configuration of Radio mode on the device:

Table 1: Radio Mode Configuration

Radio Role	Radio Mode	Description
Fixed Infrastructure	Fixed Fluidmax primary Fluidmax secondary	P2P mode (point to point) P2MP (point to multipoint) mode (Fluidmax) and P2MP P2MP mode (Fluidmax) and P2MP
Mobility AP	Fluidity	Mobility mode
Mobility Client	Fluidity	Mobility mode

Following table shows the Fluidity status and it is derived from operating mode of enabled radio interfaces:

Table 2: Operating Mode of Radio Interface

Radio 1 / Radio 2	Fixed Infrastructure	Fluidity
Fixed Infrastructure	Fluidity disabled	Fluidity enabled
Fluidity	Fluidity enabled	Fluidity enabled

Multiple and dual radio interfaces are possible based on the following table:

Table 3: Configuration of Multiple Radio interfaces

Radio 1 / Radio 2	Fixed Infrastructure / Mesh	Mobility AP	Mobility client
Fixed Infrastructure / Mesh	ME/MP relay, P2MP (mesh)	Yes, trailer use case (Mining trailer)	Supported but no specific use case
Mobility AP	Yes, trailer use case (Mining trailer)	Standard Fluidity (multiple clients on each radio)	Not supported, use V2V or Fixed + AP
Mobility client	Supported but no specific use case	Not supported, use V2V or Fixed + AP	Standard Fluidity (multiple clients on each radio)

Configuring Radio-off Mode from CLI

To configure Radio-off mode when both radios (Fluidity and fixed) are disabled, use the following CLI commands and procedure:



Note If you specify radio-off, the device disables all the wireless interfaces.

1. Set the device's current operating mode. Mode could be mesh end, mesh point or global gateway (L3).

   ```
   Device# configure modeconfig mode {meshpoint | meshend | gateway}
   ```

2. Set the device's selected Multi-Protocol Label Switching (MPLS) OSI layer and the possible value of layer is 2 (OSI Layer-2) or 3 (OSI Layer-3).

   ```
   Device# configure modeconfig mode {meshpoint | meshend | gateway}[layer {2|3}]
   ```

3. To set the radio-off mode.

   ```
   Device# configure modeconfig mode { meshpoint | meshend | gateway } [layer {2|3}] [
   radio-off {fluidity | fixed}]
   ```

4. To end the current configuration, use the following CLI command:

   ```
   Device# (configure modeconfig mode { meshpoint | meshend | gateway } [layer {2|3}] [
   radio-off {fluidity | fixed}])# end
   ```

```
Device# wr
```

Example:

```
Configure modeconfig mode meshend radio-off fluidity
Configure modeconfig mode meshend radio-off fixed
```

Configuring Radio Mode for URWB from CLI

To configure Radio mode for URWB, use the following CLI commands:

To select the operating function of the wireless interface, use these CLI commands. Device allows mixed Fluidity and fixed infrastructure combinations for different interfaces.

1. Configure the wireless with radio interface number <1 or 2>.

   ```
   Device# configure dot11Radio <interface>
   ```

2. Configure an operating mode for the specified interface.

   ```
   Device# configure dot11Radio <interface> mode {fixed|fluidity|fluidmax}
   ```

   Fluidity - This interface operates the device in Fluidity, either as a mobility infrastructure or as a vehice mode.

   Fixed - This interface operates in fixed infrastructure mode (no Fluidity).

   Fluidmax - This interface operates in Fluidmax P2MP mode. More parameters can be specified to configure the Fluidmax operating features, for example: Primary/Secondary role and cluster ID.

3. Set Fluidmax role for Fluidmax interface mode.

   ```
   Device# configure dot11Radio <interface>mode {fixed|fluidity|fluidmax} {primary |
   secondary}
   ```

   Primary - set Fluidmax role to primary

   Secondary - set Fluidmax role to secondary

4. To end the current configuration, use the following CLI command:

   ```
   Device (configure dot11Radio <interface>mode{fixed|fluidity|fluidmax}) # end
   Device# wr
   ```



Note When at least one interface is set to Fluidity mode, the device operates globally in Fluidity mode. If all interfaces are set to fixed, Fluidity is disabled.

Configuring AMPDU from CLI

To configure an aggregated MAC protocol data unit's (ampdu) length and priority, use the following CLI commands:

```
Device# configure dot11radio <interface> ampdu length <length>
```

length: <0-255> integer number – microseconds.

```
Device# configure dot11radio <interface> ampdu priority {enable | disable}
```

enable: enable ampdu tx priority.

disable: disble ampdu tx priority.

```
Device# configure dot11radio <interface> ampdu priority [enable]
```

0: ampdu tx priority for index 0.

1: ampdu tx priority for index 1.

2: ampdu tx priority for index 2.

3: ampdu tx priority for index 3.

4: ampdu tx priority for index 4.

5: ampdu tx priority for index 5.

6: ampdu tx priority for index 6.

7: ampdu tx priority for index 7.

all: ampdu tx priority for all indexes (index 0 to 7)

Configuring Frequency from CLI

To configure an operating frequency, use the following CLI command:

```
Device# configure dot11radio <interface> frequency <frequency>
```

frequency: <0-7125> operating frequency in MHz

Configuring Maximum Modulation Coding Scheme Index from CLI

To configure maximum modulation coding scheme (MCS) index, use the following CLI command:

```
Device# configure dot11radio <interface> mcs <maxmcs>
```

Set maximum MCS index in integer or string AUTO. For AUTO, the background process automatically configures the maxmcs.

Maxmcs values:

< 0-11 > Maximum mcs index 0 to 11.

Word AUTO



Note If High Efficiency mode is disabled, set the MCS index value ranging from zero to nine. If High Efficiency mode is enabled, set the MCS index value as 10 or 11.

Configuring Maximum Number of Spatial Streams Index from CLI

To configure maximum number of spatial streams (NSS) index, use the following CLI command:

```
Device# configure dot11radio <interface> spatial-stream <maxnss>
```

Set maximum spatial stream number in integer or string AUTO. For AUTO, the background process automatically configures the maxnss.

Maxnss values:

< 1-4 > Maximum nss index 1 to 4.

Word AUTO



Note Catalyst IW9165 supports up to two spatial streams and Catalyst IW9167 supports up to four spatial streams. The maximum number of spatial streams configured must be same or less than the number of antennas enabled.

Configuring Rx-SOP Threshold from CLI

To configure receiver start of packet (Rx-SOP) threshold, use the following CLI command:

```
Device# configure dot11radio <interface> rx-sop-threshold
```

<0 - 91> Enter rx-sop- threshold (0: AUTO, VALUE: -VALUE dBi).

Configuring RTS Mode from CLI

To disable ready to send (RTS) mode, use the following CLI command:

```
Device# configure dot11radio <interface> rts <disable>
```

Disable: Disables the RTS protection.

To enable RTS with threshold value, use the following CLI command:

```
Device# configure dot11radio <interface> rts enable <threshold>
```

Threshold: Threshold range <0 - 2346>.

Configuring WMM Mode from CLI

To configure wireless multimedia (WMM) mode, use the following CLI command:

```
Device# configure dot11radio <interface> wmm [bk|be|vi|vo]
```

[bk|be|vi|vo]: Represents the class-of-service (CoS) parameters.

be: Best-effort traffic queue (CS0 and CS3).

bk: Background traffic queue (CS1 and CS2).

vi: Video traffic queue (CS4 and CS5).

vo: Voice traffic queue (CS6 and CS7).

To clear wireless stats counters, use the following CLI command:

```
Device# configure dot11Radio <interface> wifistats <clear>
```

Clear: Clear wireless stats counters.

Configuring NTP from CLI

To configure the NTP server address, use the following CLI command:

```
Device# configure ntp server <string>
```

String - IP address or domain name.

Example:

```
Device# configure ntp server 192.168.216.201
```

To configure the NTP authentication, use the following CLI command:

```
Device# configure ntp authentication none
Device# configure ntp authentication md5 <password> <keyid>
Device# configure ntp authentication sha1 <password> <keyid>
```

none - disable the NTP authentication md5|sha1 - authentication method.

Example:

```
Device# configure ntp authentication md5 test1234 65535
```



Note Optional, the md5 password and keyid should match NTP server's md5 password and keyid.

To configure a new password using a GUI or CLI, the password should match the following criteria:

- The password length range is from 8 to 20 characters.
- The following special characters are not allowed:
  - ' (apex)
  - " [double apex]
  - ` [backtick]
  - $ [dollar]
  - = [equal]
  - \ [backslash]
  - # [number sign]
  - whitespace

To enable or disable the NTP service, use the following CLI command:

```
Device# configure ntp { enable|disable }
```

To configure the NTP timezone, use the following CLI command:

```
Device# configure ntp timezone <string>
```

Example:

```
Device# configure ntp timezone Asia/Shanghai
```

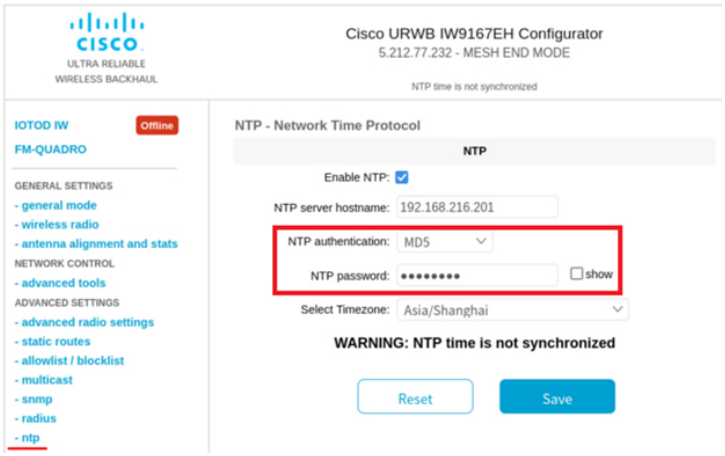
To validate the NTP configuration and status, use the following show commands:

```
Device# show ntp config
NTP status: enabled
NTP server: 192.168.216.201
authentication: MD5
password: test123
keyid: 5
timezone: Asia/Shanghai

Device# #show ntp (Using this command to check if device can sync up time with NTP server)
Stratum Version Last Received  Delay    Offset  Jitter    NTP server
1          4      9sec ago    1.840ms -0.845ms 0.124ms 192.168.216.201
```

Configuring NTP using GUI

The following image shows the GUI of NTP:



Validating Radio Mode for URWB

To validate Radio mode, use the following show commands:

```
Device# show dot11Radio <interface> config
```

Example:

```
Device# show dot11Radio 1 config
Interface : enabled
Mode : fluidity
Frequency : 5785 MHz
```

```
Channel : 157
Channel width : 40 MHz
```

```
Device# show dot11Radio 2 config
Interface : enabled
Mode : fluidmax secondary
Frequency : 5180 MHz
Channel : 36
Channel width : 40 MHz
```

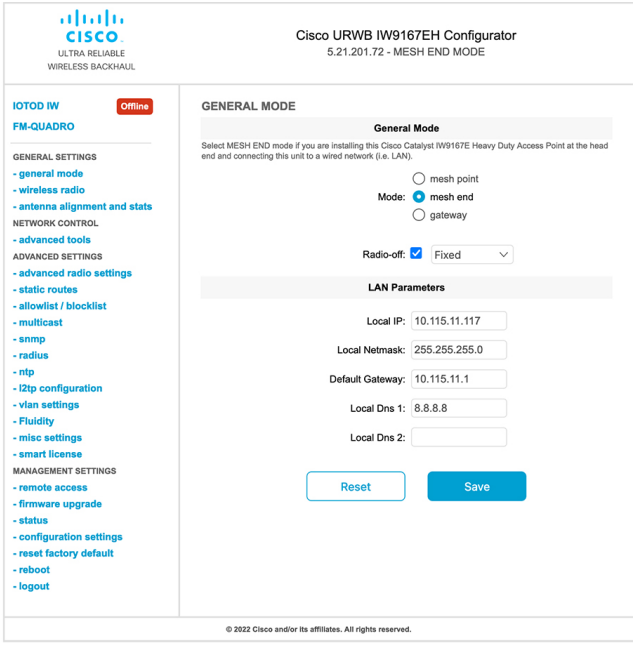
To change the Radio mode of vehicle access point (mobility client) to Fixed or Fluidmax, configure Fluidity role as infrastructure using CLI:

```
Device# configure fluidity id infrastructure
```

.

Configuring Radio-off Mode using GUI

To configure **Radio-off** mode, choose either **Fixed** or **Fluidity** mode as shown. Select mode as **mesh end**, if you are installing the Catalyst IW9167E access point at the head end and connecting this device to a wired network such as LAN.

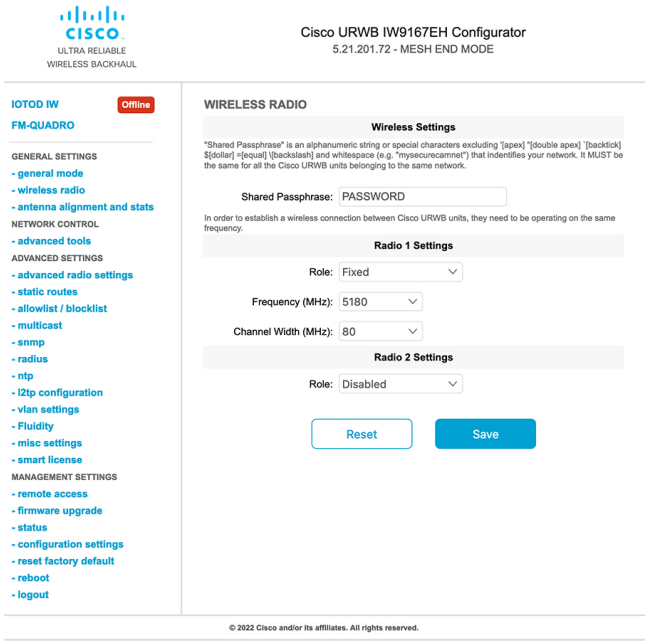


Configuring Radio Mode using GUI

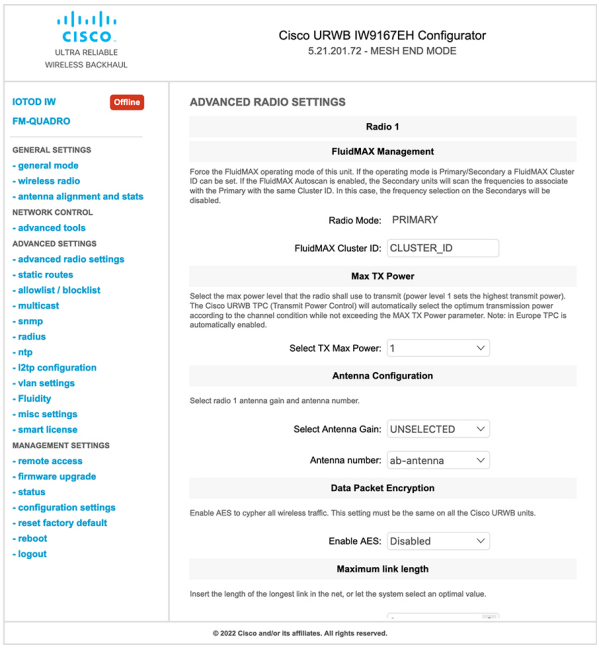
To establish a wireless connection the operating frequency should be same between the devices.

To configure a Radio mode using GUI, follow these steps:

1. Set the operating mode for specified radio (Radio1 and Radio2) interface.

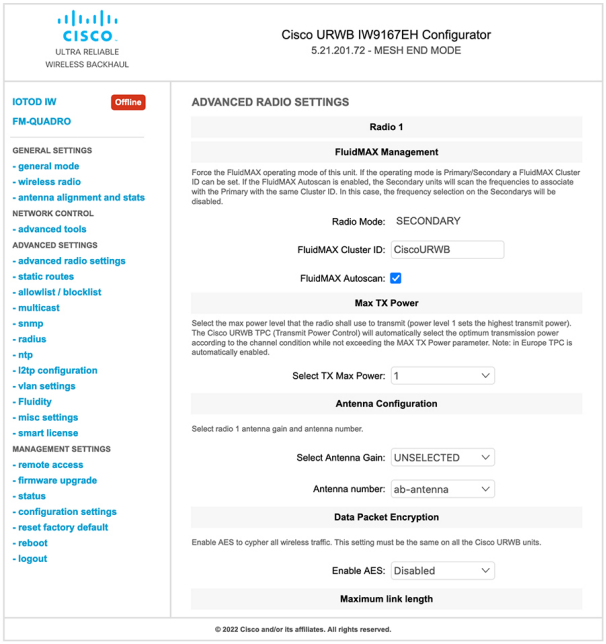


2. In the **WIRELESS RADIO** section, choose Radio 1 Role as **Fluidmax Primary** with FluidMAX Cluster ID. In this scenario, the frequency selection for the Primary is enabled and Secondary is disabled. In the **ADVANCED RADIO SETTINGS** window, go to **Max TX Power** section, and choose power level as 1 from the **Select TX Max Power** drop-down list and URWB transmission power control (TPC) automatically selects the optimum transmission power.



Note In Europe TPC is automatically enabled.

3. In the **WIRELESS RADIO** section, choose Radio 1 Role as **Fluidmax Secondary** with FluidMAX Cluster ID. In the **ADVANCED RADIO SETTINGS**, if you check the **FluidMAX Autoscan** check box, the secondary devices scan the frequencies to associate with the Primary with the same Cluster ID. In this case the frequency selection on the Secondary is in disable mode. In the **Max TX Power** section, and choose power level as 1 from the **Select TX Max Power** drop-down list and URWB TPC automatically selects the optimum transmission power.



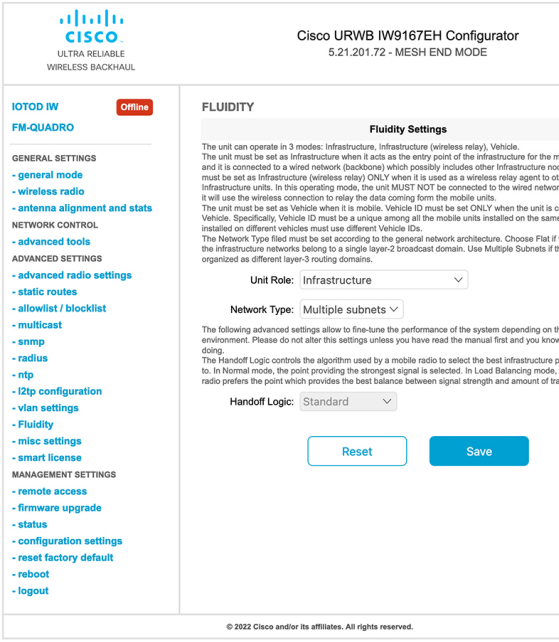
Note In Europe TPC is automatically enabled.

4. In the **Fluidity Settings** section, choose **Unit Role** as **Infrastructure** from the drop-down list, When the device acts as the entry point of the infrastructure for the mobile vehicles or choose unit role as **Infrastructure (wireless relay)** only when it used as a wireless relay agent to other infrastructure unit or choose unit role as a **Vehicle** when it is mobile.
5. Choose network type based on the to the general network architecture:
   a. Choose **Flat** mode from **Network Type** drop-down list, if the network belongs to single layer-2 broadcast domain.

      or

   b. Choose **Multiple subnets** if the network belongs to single layer-3 broadcast domain.


ULTRA RELIABLE
WIRELESS BACKHAUL
Cisco URWB IW9167EH Configurator
5.21.201.72 - MESH END MODE
IOTOD IW
Offline
FM-QUADRO
GENERAL SETTINGS
- general mode
- wireless radio
- antenna alignment and stats
NETWORK CONTROL
- advanced tools
ADVANCED SETTINGS
- advanced radio settings
- static routes
- allowlist / blocklist
- multicast
- snmp
- radius
- ntp
- l2tp configuration
- vlan settings
- Fluidity
- misc settings
- smart license
MANAGEMENT SETTINGS
- remote access
- firmware upgrade
- status
- configuration settings
- reset factory default
- reboot
- logout
WIRELESS RADIO
Wireless Settings
"Shared Passphrase" is an alphanumeric string or special characters excluding '[apex] "[double apex] `[backtick] $[dollar] =[equal] \[backslash] and whitespace (e.g. "mysecurecamnet") that indentifies your network. It MUST be the same for all the Cisco URWB units belonging to the same network.
Shared Passphrase: PASSWORD
In order to establish a wireless connection between Cisco URWB units, they need to be operating on the same frequency.
Radio 1 Settings
Role: Fluidity
Frequency (MHz): 5180
Channel Width (MHz): 80
Radio 2 Settings
Role: Disabled
Reset
Save
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ULTRA RELIABLE
WIRELESS BACKHAUL
Cisco URWB IW9167EH Configurator
5.21.201.72 - MESH END MODE
IOTOD IW
Offline
FM-QUADRO
GENERAL SETTINGS
- general mode
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- vlan settings
- Fluidity
- misc settings
- smart license
MANAGEMENT SETTINGS
- remote access
- firmware upgrade
- status
- configuration settings
- reset factory default
- reboot
- logout
FLUIDITY
Fluidity Settings
Unit Role: Infrastructure
Network Type: Multiple subnets
Handoff Logic: Standard
Reset
Save
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