Configuring Cisco URWB Radio Mode

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Configuring Cisco URWB Radio Mode

Each wireless interface can be configured to operate in a specific mode or disabled. Mode on Radio can be configured on the device will operate as a Fluidity or fixed infrastructure unit as specified by the parameter.

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

Table 1: Radio Mode Configuration

Radio Role	Mode on Radio*	Description
Fixed Infrastructure	fixed Fluidmax primary Fluidmax secondary	P2P mode (point to point) P2MP (point to multipoint) mode (Fluidmax), P2MP, Master P2MP mode (Fluidmax), P2MP
Mobility AP	Fluidity	Mobility Mode

Radio Role	Mode on Radio*	Description
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 can be used according to 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. If radio-off is specified, all the wireless interfaces will be disabled.

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 MPLS (Multi-Protocol Label Switching) OSI layer. 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. Specify radio-off mode.

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

4. End of configuration.

   ```
   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 Fluidity Role from CLI

To configure Fluidity role (infra or client) use the following Fluidity CLI commands and procedure.

1. Configure the Fluidity role (infrastructure or mobile)

```
Device# configure fluidity id
```

2. Configure Fluidity id mode

```
Device# configure fluidity id {mode}
Mode will be one of the following values
vehicle-auto - vehicle mode with automatic vehicle ID selection
vehicle ID - (alphanumeric) vehicle mode with manual ID.
infrastructure - infrastructure mode
wireless-relay - wireless infrastructure with no ethernet connection to the backhaul
```

3. End of configuration .

```
Device (configure fluidity id {mode}) # end
Device# wr
```

Example:

```
Device# configure fluidity id [vehicle-auto | infrastructure | vehicle-id |
wireless-relay]
```

Configuring Radio Mode for Cisco URWB from CLI

To configure Radio mode for Cisco URWB, use the following CLI commands and procedure.

The below CLI commands used to select the operating function of the wireless interface also mixed Fluidity and fixed infrastructure combinations for different interfaces are allowed.

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 will operate in Fluidity mode, either as a mobility infrastructure or a vehice unit.

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

Fluidmax - This interface will operate in Fluidmax P2MP mode. Additional parameters can be specified to configure the Fluidmax operating features (e.g., Primary/Secondary role, 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. End of configuration.

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

Note When at least one interface is set to Fluidity mode, the unit will globally operate in Fluidity mode. If all interfaces are set to fixed, Fluidity will be disabled.

Configuring AMPDU from CLI

To configure an ampdu (Aggregated MAC Protocol Data Unit) 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 all

Configuring Frequency from CLI

To configure an operating frequency, use the following CLI commands.

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

frequency: <0-7125> Operating frequency in MHz.

Configuring Maximum MCS Index from CLI

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

Set maximum MCS index in integer or string “AUTO”. For “AUTO”, the background process will automatically configure the maxmcs.

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

maxmcs values:

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

WORD AUTO.

Note The maximum MCS can be set between 0 to 9 if High Efficiency mode is disbled and maximum MCS can be set as 10 and 11 if High Efficiency mode is enabled.

Configuring Maximum NSS (Number of Spatial Streams) Index from CLI

To configure maximum NSS (Number of Spatial Streams) index, use the following CLI commands:

Set maximum spatial stream number in integer or string “AUTO”.

For “AUTO”, the background process will automatically configure the maxnss.

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

maxnss values:

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

WORD AUTO.

Configuring Rx-SOP Threshold from CLI

To configure Rx-SOP (Receiver Start of Packet) threshold, use the following CLI commands.

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

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

Configuring RTS Mode from CLI

To configure RTS (Ready to Send) mode, use the following CLI commands.

To disable RTS, use the following CLI command.

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

disable: disable rts protection.

To enable RTS with threshold value, use the following CLI commands.

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

threshold: threshold range <0 - 2346>.

Configuring WMM Mode from CLI

To configure a WMM mode (wireless multimedia), use the following CLI commands.

```
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 Enhancement from CLI

To configure a NTP (Network Time Protocol) 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 a 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 NTP authentication md5|sha1 - authentication method.

Example:

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

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

password must be between 8 and 20 characters.

The following special characters are not allowed: ' [apex] " [double apex] ` [backtick] $ [dollar] = [equal] \ [backslash] # [number sign] and whitespace

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

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

To configure NTP timezone, use the following CLI command.

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

Example:

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

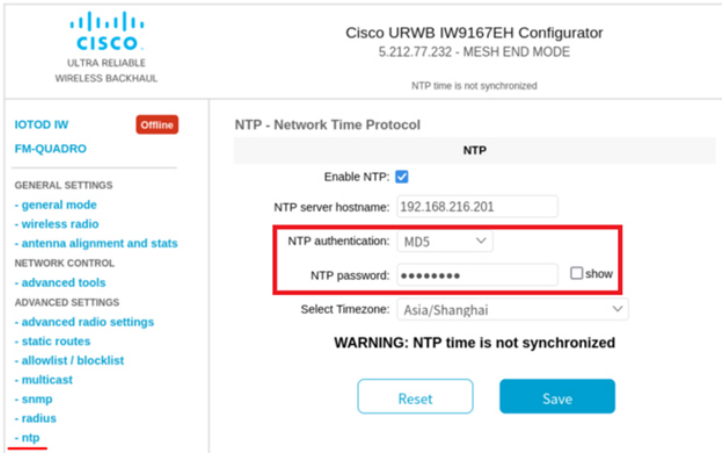
To validate NTP configuration and status, use the following show commands.

```
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 Enhancement from GUI

The following image shows the Web UI of NTP enhancement.



Validating Radio Mode for Cisco URWB

To validate radio mode, use the following show commands.

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

Example:

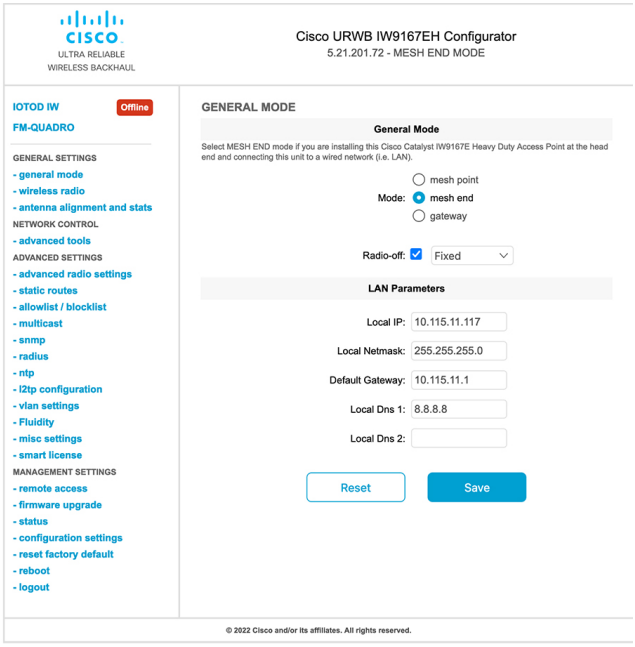
```
Device# show dot11Radio 1 config
Interface : enabled
Mode : fluidity
Frequency : 5785 MHz
Channel : 157
Channel width : 40 MHz
```

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

If need to change radio mode of vehicle AP (mobility client) to fixed or fluidmax, need to configure fluidity role as infrastructure by CLI “configure fluidity id infrastructure”.

Configuring Radio-off Mode from GUI

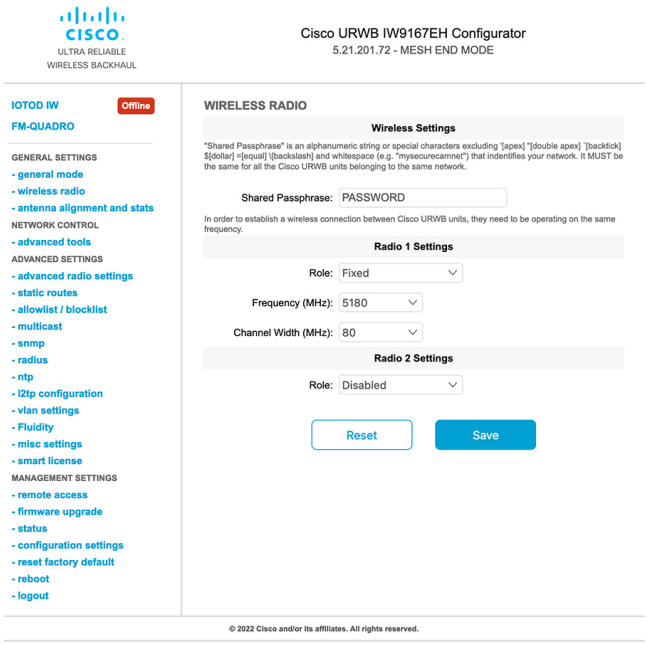
To configure a Radio-off mode, choose a fixed or fluidity mode as shown in the below image. Select a mesh end mode if you are installing the Cisco IOT IW9167E Heavy Duty Access Point at the head end and connecting this unit to a wired network such as LAN.



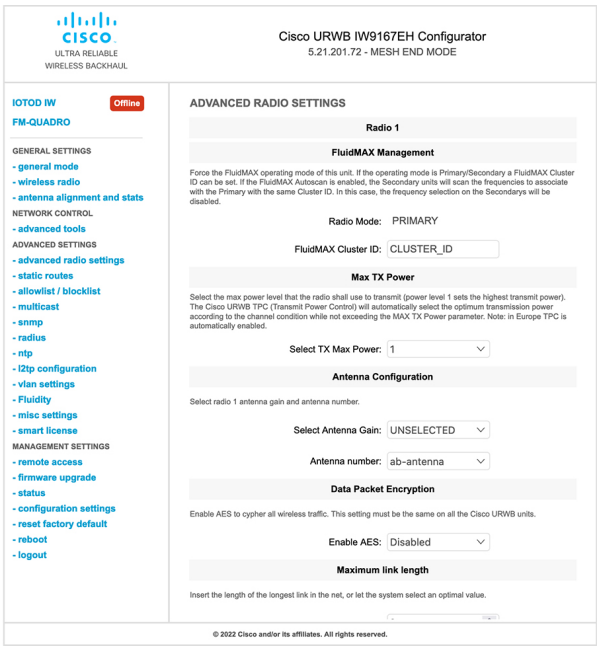
Configuring Radio Mode from GUI

To configure a radio mode from GUI, use the following procedures.

1. To establish a wireless connection the operating frequency should be same between Cisco URWB units. To configure a Radio mode from GUI, set the operating mode for specified radio (Radio1 and Radio2) interface as below diagram.

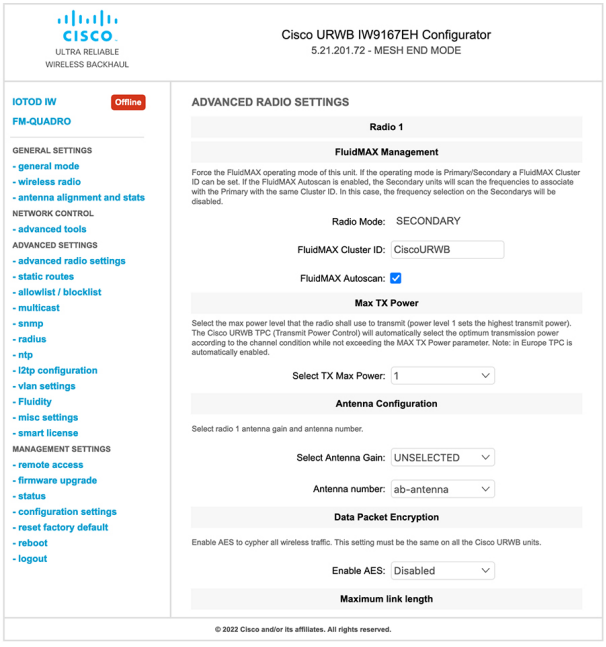


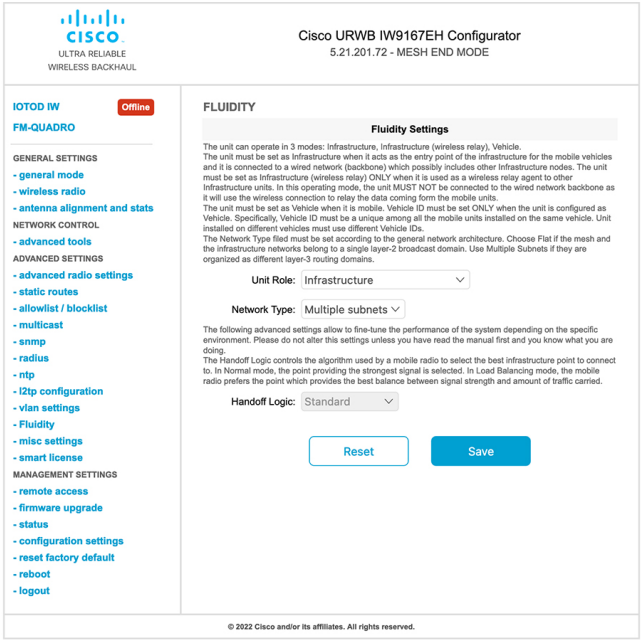
2. Set Radio 1 operating mode(role) as a Fluidmax Primary with FluidMAX Cluster ID. In this case the frequency selection on the Primary will be enabled and Secondary will be disabled. Select the maximum power level (power level 1 sets the highest transmit power) and Cisco URWB transmission power control (TPC) will automatically select the optimum transmission power.



Note In Europe TPC is automatically enabled.

3. Set Radio 1 operating mode(role) as a Fluidmax Secondary with FluidMAX Cluster ID. If the FluidMAX Autoscan is enabled, the secondary units will scan the frequencies to associate with the Primary with the same Cluster ID. In this case the frequency selection on the Secondary will be disabled. Select the maximum power level (power level 1 sets the highest transmit power) and Cisco URWB transmission power control (TPC) will automatically select the optimum transmission power.



Note In Europe TPC is automatically enabled.

4. Choose unit role as Infrastructure when it 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. Choose network type set according to the general network architecture and choose flat mode if the network belongs single layer-2 broadcast domain or choose multiple subnets if the network belongs single layer-3 broadcast domain.