

# Configure Fluidity on IW APs Using IoT OD

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## Introduction

This document describes configuration of fluidity on Industrial Wireless (IW) APs operating in CURWB using templates in the IoT Operations Dashboard.

## Accessing IoT OD

The IW Access Points (APs) like IW9165 and IW9167 can be configured in either CAPWAP or URWB mode.

When these access points are configured in the URWB mode, they can be configured using the IoT-Operations Dashboard or locally in offline mode. The IoT Operations Dashboard can be accessed with these links, depending on where the tenants are located.

<https://us.ciscoiot.com>

<https://eu.ciscoiot.com>

After logging in and picking the right tenant, select Industrial Wireless under Service to access the feature set for Cisco Ultra-Reliable Wireless Backhaul (CURWB) radios.



The screenshot shows the Cisco IoT Operations Dashboard. On the left, there is a sidebar with three main sections: 'Service', 'Inventory', and 'Configuration'. The 'Service' section is expanded, showing 'Industrial Wireless' as the selected option, highlighted with a red box. The main content area on the right is titled 'Industrial Wireless' and contains a list of services: 'Application Manager', 'Asset Vision', 'Cyber Vision', 'Edge Device Manager', 'Edge Intelligence', 'Industrial Wireless', and 'Secure Equipment Access'. The 'Industrial Wireless' option in this list is also highlighted with a red box and has a blue checkmark to its right.

## Manual Onboarding

Devices can be manually onboarded to IoT OD from the Inventory page.

Select Add Devices and pick the PID of the devices that are added. A CSV file can be uploaded with the Serial Number and MAC Address of the devices on it; each line has one entry.

Example: SN001234,00:f1:ca:00:00:01

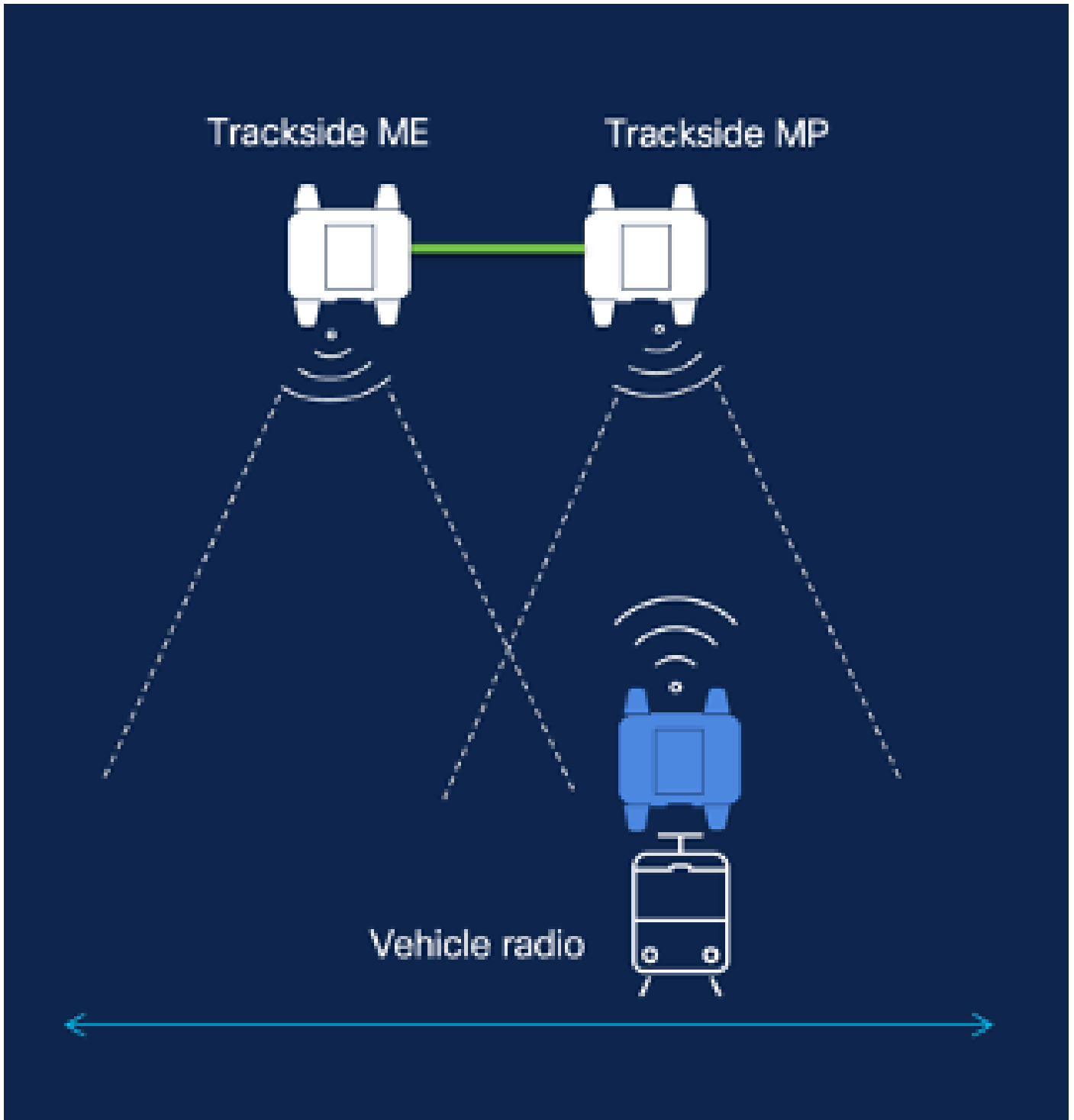
SN003457,00:f1:ca:00:00:02

Once uploaded, click Add devices at the bottom to manually import devices to the dashboard. They then show up under the Inventory tab.

## Fluidity Configuration

A basic Fluidity setup with IW916x Access Points can be configured via IoT OD with this procedure.

Consider three APs, Radio A acting as a Trackside Mesh End, Radio B as a Trackside Mesh Point, and Radio C acting as a Vehicle radio.



1. Once the devices are added to IoT OD and the status is 'Online', the configuration can be edited by selecting the required device. Click on the device and go to the 'Configuration' tab, select the 'Edit' button to update the configuration.

Device Configuration [Edit](#) [Push IoT OB Configuration](#)

IoT OB Configuration

ID 0

Saved - 2024-06-24 10:49:38 am

Last heard configuration

ID -

Last heard - 2024-06-26 23:08:22 pm

 Last heard and IoT OB Configuration do not match.

[Review previous configurations](#)

Only show differences

- General
- Wireless Radio
- Advanced Radio Settings
- Key Control
- FastMAN
- Multicast
- SNMP
- Radios
- NTP

General

|                  | IoT OB        | Last Heard      |
|------------------|---------------|-----------------|
| Mode             | Mesh Point    | Mesh End        |
| Radio off        | Off           | Off             |
| Local IP Address | 192.168.0.10  | 10.122.136.9    |
| Local Netmask    | 255.255.255.0 | 255.255.255.192 |
| Default Gateway  |               | 10.122.136.1    |
| Local Dns 1      |               | 172.18.168.24   |
| Local Dns 2      |               | 172.18.168.43   |

# Edit Device Configuration

- General**
- Wireless Radio
- Advanced Radio Settings
- Key Control
- FluidMAX
- Multicast
- SNMP
- Radius
- NTP
- L2TP
- Vlan
- Fluidity
- Fluidity Advanced
- Fluidity Pole Proximity

## General

---

**Mode**  
•

**Mesh Point**

---

**Radio off**

**Radio off mode**

---

**Local IP Address**  
•

---

**Local Netmask**  
•

2. For a Fluidity setup, in the 'General' section, at least one of the Trackside radios must be configured as a Mesh End. In this setup, Radio A is the Trackside Mesh End and Radio B is the Trackside Mesh Point. All the Vehicle radios must be configured as Mesh Points. There is only one Vehicle radio, Radio C in this setup. Radio Mode for all radios are set to 'Fluidity'.

# Edit Device Configuration

Search

- General
- Wireless Radio
- Advanced Radio Settings
- Key Control
- FieldMAX
- Multicast
- SNMP
- Radius
- NTP
- L2TP
- Vlan
- Fieldity
- Fieldity Advanced
  - Fieldity Pole Proximity
  - Fieldity Frequency Scan
- Fieldity MPO

## General

● **Mode**  
-  
Mesh End

● **Radio off**

● **Radio off mode**  
-  
Fluidity

**Local IP Address**  
-  
192.168.0.10

**Local Netmask**  
-  
255.255.255.0

**Default Gateway**

Radio A config

# Edit Device Configuration

🔍 Search

- General
- Wireless Radio
- Advanced Radio Settings
- Key Control
- FluidMAX
  - Multicast
  - SNMP
  - Radius
  - NTP
  - L2TP
  - Vlan
- Fluidity
- Fluidity Advanced
  - Fluidity Pole Proximity
  - Fluidity Frequency Scan
- Fluidity MPO

## General

Mode

-

Mesh Point



Radio off



Radio off mode

-

Fluidity



Local IP Address

-

192.168.0.10

Local Netmask

-

255.255.255.0

Default Gateway

# Edit Device Configuration

Search

- General
- Wireless Radio
- Advanced Radio Settings
- Key Control
- FluidMAX
- Multicast
- SNMP
- Radius
- NTP
- L2TP
- Vlan
- Fluidity
- Fluidity Advanced
  - Fluidity Pole Proximity
  - Fluidity Frequency Scan
- Fluidity MPO

## General

Mode  
-

Mesh Point ⌵

---

Radio off

Radio off mode  
-

Fluidity ⌵

---

Local IP Address  
-

192.168.0.10

---

Local Netmask  
-

255.255.255.0

---

Default Gateway

## Radio C Config

3. Under the 'Wireless Radio' section, make sure all three of the radios have the same passphrase. We are only enabling one radio per IW device for this setup. Enable the radio you picked (Radio 1 or Radio 2), and make sure all the radios have the same frequency and channel width configured. When connecting antennas, please make sure to pick the external ports based on the radio number selected. Also, the radio mode is



configured as 'Fluidity' for all three radios.

## Edit Device Configuration

Search

- General
- Wireless Radio**
- Advanced Radio Settings
- Key Control
- FluidMAX
- Multicast
- SNMP
- Radio
- MTP
- L2TP
- Wlan
- Fluidity
- Fluidity Advanced
- Fluidity Role Proximity
- Fluidity Frequency Scan
- Fluidity MPO

### Wireless Radio

Passphrase  
CiscoIWB

Radio 1 enabled  Radio 2 enabled

Radio 1 role  Radio 2 role   
Fluidity Select Value

Radio 1 Frequency (MHz)  Radio 2 Frequency (MHz)   
5180 MHz Select Value

Radio 1 Channel width  Radio 2 Channel width   
80 Select Value

4. Under the 'Fluidity' section, the Unit role is to be selected as 'Infrastructure' for Radio A and Radio B which are the trackside radios.

# Edit Device Configuration

Search

- General
- Wireless Radio
- Advanced Radio Settings
- Key Control
- FluidMAX
- Multicast
- SNMP
- Radius
- NTP
- L2TP
- Vlan
- Fluidity**
- Fluidity Advanced
  - Fluidity Pole Proximity
  - Fluidity Frequency Scan
- Fluidity MPO

## Fluidity

- Unit Role**
  - Infrastructure
- Automatic Vehicle ID**
  -
- Vehicle ID**
- Network Type**
  - Flat
- Handoff Logic**
  - Select Value
- Enable Primary Pseudowire Enforcement**

5. Under the Fluidity section, on Radio C the Unit role is selected as 'Vehicle'. Since this is a Layer 2 Fluidity network, the Network type would be 'Flat'. If multiple Vehicle radios are used on a single vehicle, 'Automatic Vehicle ID' can be enabled or a manual vehicle ID can be assigned.

# Edit Device Configuration

🔍 Search

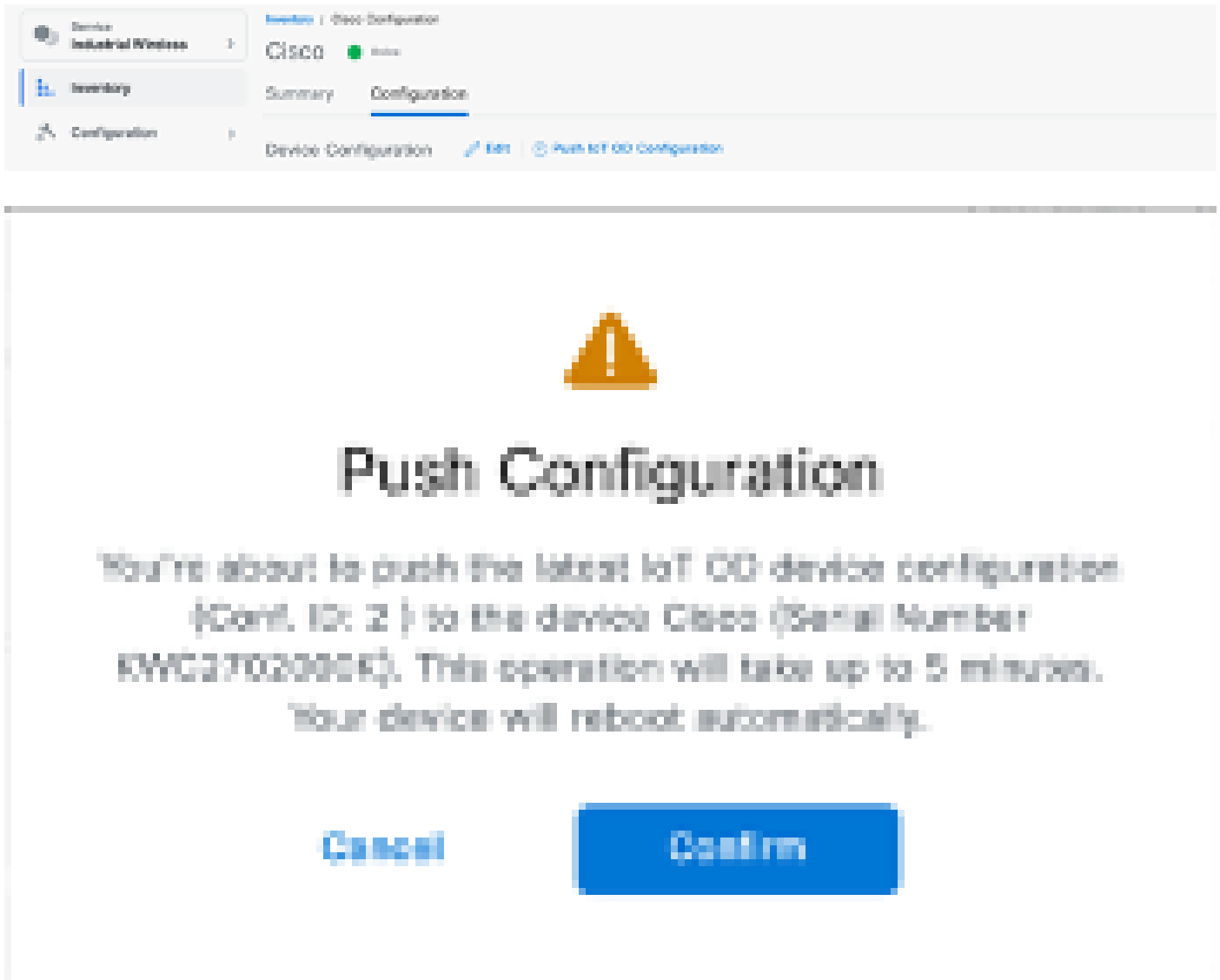
- General
- Wireless Radio
- Advanced Radio Settings
- Key Control
- FluidMAX
- Multicast
- SNMP
- Radius
- NTP
- L2TP
- Vlan
- Fluidity**
- Fluidity Advanced
- Fluidity Pole Proximity
- Fluidity Frequency Scan
- Fluidity MPO

## Fluidity

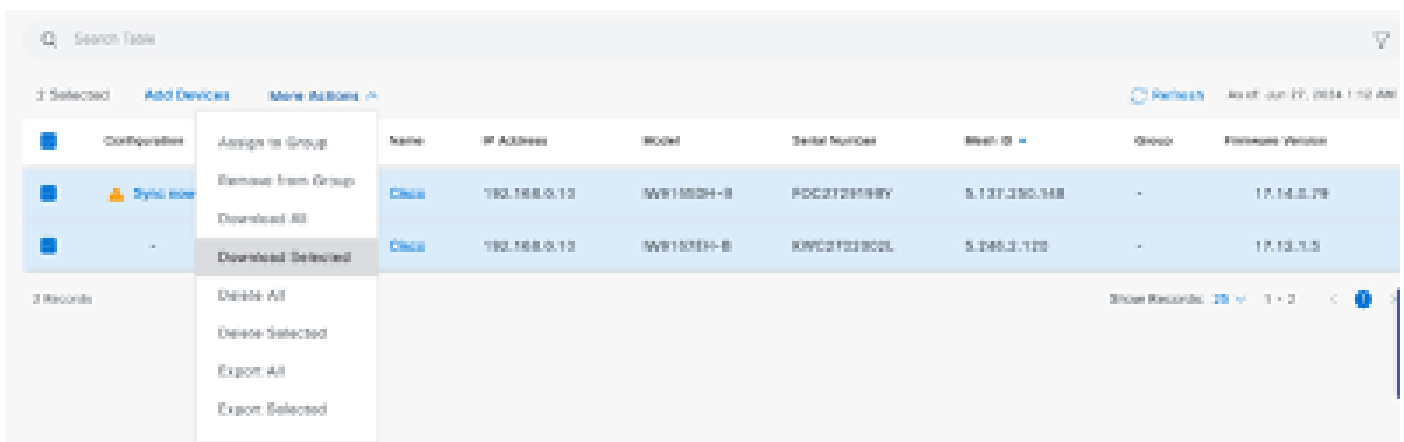
- Unit Role
  - Vehicle
- Automatic Vehicle ID
  -
- Vehicle ID
- Network Type
  - Flat
- Handoff Logic
  - Standard
- Enable Primary Pseudowire Enforcement

Once the configuration is edited, click 'Save' at the bottom.

6. Now the updated configuration can be pushed from IoT-OD directly to the radios with the 'Push IoT OD Configuration' button. Hit Confirm once prompted. The device is rebooted and accessible from the IP from the pushed config.



7. Another option to push config, if the radios are 'Offline' is to download the configuration file. From the Inventory tab, select one or multiple devices, and from the 'More Actions' dropdown menu, select the 'Download Selected' button.



A file with the extension .iwconf is downloaded. The same file can be uploaded to the GUI of the devices from the IoT-OD tab.

**IOTOD IW** Offline

**IW-MONITOR** Enabled

**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
- ethernet filter
- l2tp configuration
- vlan settings
- Fluidity
- misc settings
- smart license

**MANAGEMENT SETTINGS**

- remote access
- firmware upgrade
- status
- configuration settings
- reset factory default
- reboot
- logout

## IOTOD IW Management

**IOTOD IW Configuration Mode**

**Preinstalling:** Initial radio configuration phase. The radio **MUST** be configured using the Centralized Web Interface ( [IOTOD Industrial Wireless US](#), [IOTOD Industrial Wireless EU](#) ) if connection is successful or manually if Offline configuration is selected.

**Offline Configuration:** It supports local parameter changes through the radio Web UI / CLI or upload of a single file downloaded from IOTOD IW section in [IOTOD Industrial Wireless](#) ( [IOTOD Industrial Wireless US](#), [IOTOD Industrial Wireless EU](#) ).

**Online Cloud-Managed Configuration:** the radio can be configured from the Centralized Web Interface (IOTOD IW section in [IOTOD Industrial Wireless US](#) or [IOTOD Industrial Wireless EU](#)) if it is connected to the Internet and can access IOTOD IW Cloud Server. Radio Web UI and CLI are read-only.

Online Cloud-Managed

Offline

### UPLOAD IOTOD IW CONFIGURATION FILE

**Upload Configuration File**

Select configuration file exported from IOTOD Industrial Wireless: Browse No file selected

Upload Configuration

The configuration can be checked from the Status page.

IoTOD IW

Cloud-Managed

IW-MONITOR

Disabled

GENERAL SETTINGS

- general mode
- wireless radio
- antenna alignment and state

NETWORK CONTROL

- advanced tools

ADVANCED SETTINGS

- advanced radio settings
- static routes
- allowlist / blocklist
- snmp
- radius
- ntp
- ethernet filter
- l2tp configuration
- vlan settings
- Fluidity
- misc settings

MANAGEMENT SETTINGS

- remote access
- status
- reboot
- logout

STATUS

Device: Cisco IOT IW9165DH Series Access Point  
Name: MP\_TRKSBackhaul  
ID: 5.137.255.148  
Serial: FCC2729180Y  
Operating Mode: Mesh Point  
Uptime: 3 days, 4:07 (h:mm:ss)  
Firmware version: 17.14.0.79

DEVICE SETTINGS

IP: 10.122.136.9  
Netmask: 255.255.255.192  
MAC address: 40:36:5a:89:fa:94  
Configured MTU: 1500

WIRED0

Status: up  
Speed: 1000 Mb/s  
Duplex: full  
MTU: 1500

WIRED1

Status: down

WIRELESS SETTINGS

Operating region: B

Radio 1

Interface: enabled  
Mode: fluidity  
Frequency: 5150 MHz  
Channel: 35  
Channel Width: 20 MHz  
Current tx power: 17 dBm  
Current tx power level: 1  
Antenna gain: not selected  
Antenna number: 2  
Radio Mode: csm/ta  
Maximum link length: 3 km

Radio 2

Interface: enabled  
Mode: fluidmax primary  
Frequency: 5240 MHz  
Channel: 48  
Channel Width: 20 MHz  
Current tx power: 8 dBm

8. The FM-Quadro page on the Mesh End radio can be accessed to check the layout of the Fluidity setup.

