Indoor & Outdoor Access Points

User Manual

INDOOR AND OUTDOOR ACCESS POINT USER MANUAL USING GUI

This document helps you to understand the product features, configuration, login and logout process of Thin and Thick Access Point. This manual guides you through the installation process and the entire software user set.

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About HFCL Limited

HFCL Limited delivers innovative, customized and competitive products and latest solutions in the high technology telecommunications infrastructure sector, thereby enabling its customers to stay ahead of their peers in technology and network efficiency.

The company's core specialization lies in manufacturing and providing a wide range of turnkey solutions. HFCL Limited has implemented several Greenfield projects (setting up CDMA & GSM networks, satellite communications, wireless spectrum management and DWDM optical transmission network), rolled out over 100,000 kilometres of OFC network, implemented over 25,000 2G/3G cell sites, provided high security applications to Defence and has developed expertise in the areas of Railways, Homeland Security and Smart cities.

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Revision History

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1 About this Document

1.1 Purpose

This document helps you to understand IO products and provides information to familiarize you with the product features. It also guides you through the installation process and the entire software user set.

1.2 Intended Audience

The intended audiences for this document are:

1. Network Administrators
2. System Administrators
3. Product managers
4. System Integration and Verification team at HFCL Limited.

1.3 Document Conventions

The different conventions used in this document are explained in the following table:

Document Conventions

Convention	Description
Note	Note provides information about important features or instructions. This appears with a background.
Caution	This alerts you to potential damage to a program, device, or system. This appears with a background.
Warning	This alerts you to potential injury or fatality. It may also alert you to potential electrical hazards. This appears with a background.
Courier new font	File and directory names are represented in Courier New font.
Bold font	Any option that needs to be selected or typed in the user interface is represented using bold font.
<home_directory>	Command variables, the values of which you must supply.
cd$HOME	A command that you must enter in a Command Line Interface (CLI) exactly as written. This appears with a background.

1.4   Terms and Abbreviations

The different terms and abbreviations used in this document are explained in the following table:

Terms and Abbreviations

Terms/Abbreviation	Expansion
AP	Access Point
BLE	Bluetooth Low Energy
CLI	Command-Line Interface
COS	Class Of Service
CPU	Central Processing Unit
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
DSCP	Differentiated Services Code Point
EMS	Element Management System
GI	Guard Interval
GPS	Global Positioning System
IP	Internet Protocol
IPV4	Internet Protocol Version 4
IPV6	Internet Protocol Version 6
LAN	Local Area Network
LED	Light-Emitting Diode

MAC	Media Access Control
MBPS	Megabits Per Second
MCS	Modulation And Coding Scheme
MIMO	Multiple-Input And Multiple-Output
MTU	Maximum Transmission Unit
OSD	On Screen Display
P2MP	Point-To-Multipoint
P2P	Point-To-Point
POE	Power Over Ethernet
RJ	Registered Jack
RSSI	Elative Received Signal Strength
RX	Received
U-BOOT	Universal Boot-Loader
UBR	Unlicensed Band Radio

2   Product Overview

Thank you for choosing the IO Access Point (AP). IO Access Points are oriented to next generation high-speed wireless access. The Access Point Configuration is controlled through GUI and WLC.

Following are the variants of IO product family:

1.   Dual Band 2x2:2 Outdoor Access Point (ION4L1).

3   Federal Communication Commission Certified

This equipment is tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

These equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If these equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

1.   Reorient or relocate the receiving antenna.
2.   Increase the separation between the equipment and receiver.
3.   Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4.   Consult the dealer or an experienced radio/TV technician for help.

FCC Caution:

To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

FCC Radiation Exposure Statement:

These equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

These devices comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1.   These devices may not cause harmful interference
2.   These devices must accept any interference received, including interference that may cause undesired operation.

3.1   Dual Band 2x2:2 Outdoor Access Point with 17dB Sector Antenna(ION4L1)

The Dual Band 2x2:2 outdoor Access Point has 17dB Sector antennas and the technical specifications are given below:

Figure 1: Dual Band 2x2:2 Outdoor Access Point with 17dB Sector Antenna

Features:

The AP Configuration will be controlled through Local GUI, cNMS UI. There will be debug CLI available for configurations.

- Support up to 802.11ac for 5GHz (2x2) MIMO
- Support of 1G Ethernet with RGMII Interface to Processor MAC
- Supporting 256MB DDR3L Memory which can be upgradable up to 512 MB
- NAND Flash Memory for Image/code
- Small form factor

Product Power Supply Details:

Description:
The Outdoor unit will be powered through 802.11af compliant 48V Active PoE.

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4   Hardware Setup

- **Architecture:**
  AP (Access Point) system architecture revolves around the Qualcomm Network Processor IPQ4019 with dedicated WLAN controller with inbuilt radios for 5GHz to support dual band simultaneous operation. The AP supports 1G Ethernet Interface.

4.1   System Requirements

Before installing the access point, make sure that your system includes the following:

1. 10/100/1000 Mbps local area network device such as a hub or switch.
2. The Category 5 UTP straight-through Ethernet cable with RJ-45 connector included in the package, or one like it.
3. We can power up the device through PoE adaptor which should be 803at/af compliant. A 100–240 V, 50–60 Hz AC power source.
4. A web browser to configure the devices.
5. At least 802.11b/g-compliant devices.

4.2   Packaging Content – For ION4L1 variants of this product

Your box contains the following items:

1. User can choose any of the Access Point model mentioned below:
   a. Dual Band 2x2:2 Outdoor Access Points with 17dB Sector Antenna (ION4L1).
2. Mounting bracket kit.
3. Quick Start Guide with cabling and access point setup instructions. If any parts are incorrect, missing, or damaged, contact HFCL Limited customer care support.

5   Getting to know the IO Access Point

5.1   Dual Band 2X2:2 Outdoor Access Point with 17dB Sector Antenna(ION4L1)

5.1.1   Front/Back / Side View

A basic overview of the front/side view of the outdoor AP is given below:
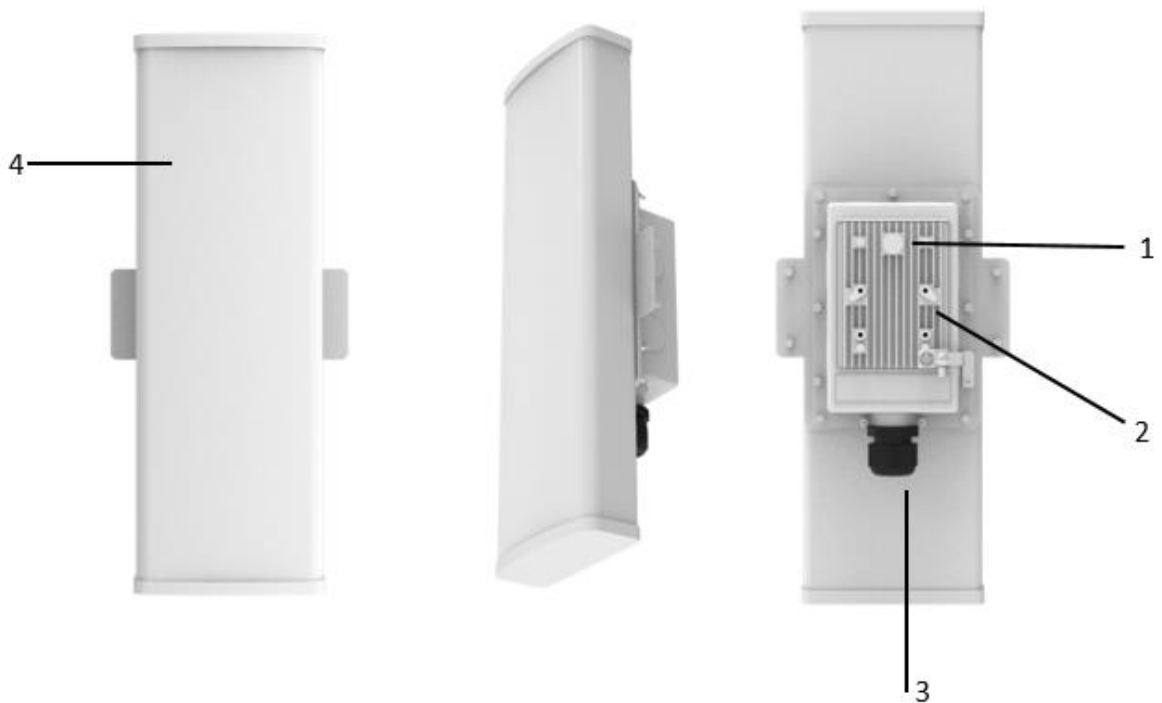

Figure 2: Front/Back/side view of the outdoor AP with 17dB Sector Antenna

Information displayed in the above figure is detailed in the table below:

Table 1: List of information displayed in side view of the outdoor AP with 17dB Sector Antenna

Callout	Name	Description
1.	Mounting bracket and holes	This helps in case of Pole mounting. In case of Pole Mounting the clamps will go through these mounting holes.
2.	Mounting screws	This helps in case of Pole mounting. In case of Pole Mounting the clamps will go through these mounting holes.
3.	LAN + PoE Port	Used for powering up the device via PoE adaptor. The same port carries the data
4.	Sector Antenna	17 dB Dish Antenna

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Note: The Reset button of outdoor AP is located below the humidity controller cap. Turn the humidity controller cap in counter clock wise direction and remove it from the access point. Use an appropriate pointed object to press the button. It serves two functions:

1. Restart: Press and release the Reset button quickly.
2. Restore to Factory Default Settings: Press and hold the Reset button for more than five seconds.

6   Initial Setup

Observe the following safety precautions and avoid damage to the access point:

1.   Do not power the device during installation.
2.   Do not subject the device to high temperatures.
3.   Keep away from high voltage cables.
4.   Disconnect the device before cleaning it.
5.   Do not wipe the device with a damp cloth.
6.   Do not wash the device with liquid.
7.   Do not open the enclosure when the AP is working.
8.   Fasten the device tightly.

6.1   Dual Band 2x2:2 Outdoor Access Point (17dB Sector Antenna)

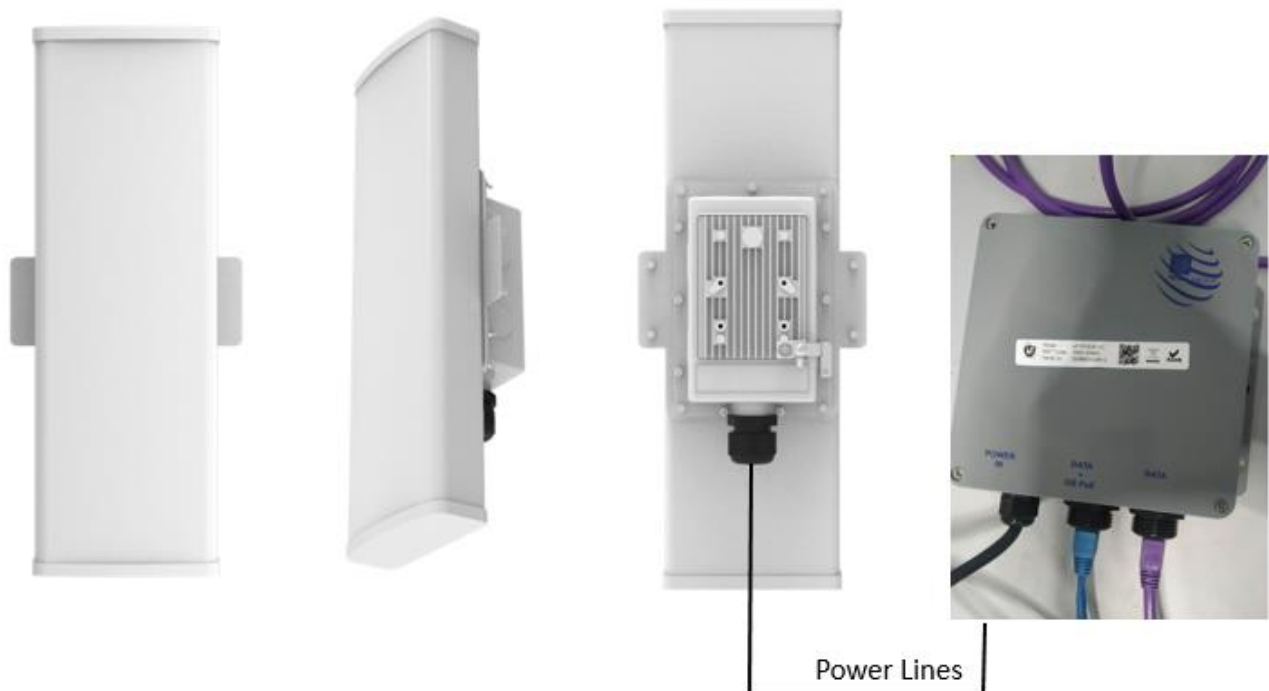Power up the device using PoE Adaptor as shown below:

Figure 3: Power up the Outdoor device of 17dB Sector Antenna using Active PoE adaptor

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6.1.1   Connect to the Outdoor Access Point

Follow the steps mentioned below and connect to the outdoor AP through GUI:

1. Configure a computer with a 1-domain static IP address e.g. 192.168.1.1 and a subnet mask of 255.255.25 5. 0.
2. For help configuring a static IP address on your computer, check the instructions or online help that came with that computer.\
3. Connect the Ethernet cable to the computer.
4. Connect the other end of the Ethernet cable to the PoE adaptor (Data/In port). Use the unused port (P+D/Out) of PoE adaptor and connect it to the LAN + PoE port of the device.

Figure 4: Connect the Outdoor Device to the network

5. Device will be powered On.
6. Open a web browser and enter the "AP static IP address" (**192.168.1.1**) in the address bar.
7. A login screen will appear.

7   Connect to the Thin Mode Access Point and Log In

You can connect to the access point's web management interface to view or change its LAN and wireless access settings. Refer the procedure mention in "Connect to the Outdoor Access Point" section and connect to a thin mode access point.

7.1   Login through GUI

This is the 1st screen of AP GUI. It provides access to the users with valid login credentials only. The login credentials will determine the access rights of the user.

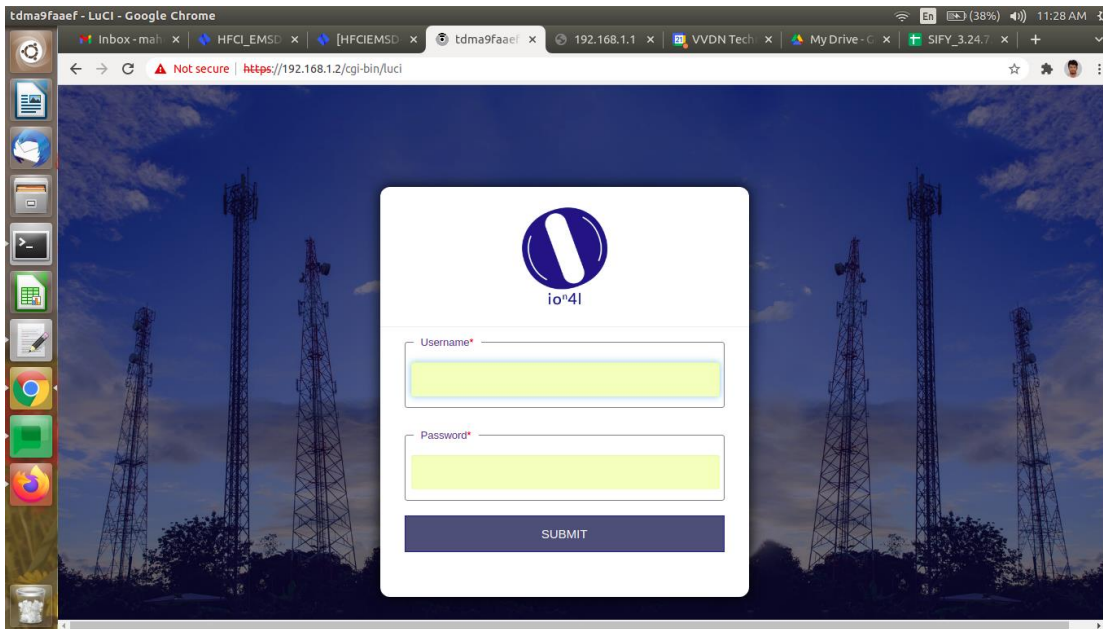A basic overview of the same is shown below:

Figure 5: Basic overview of login screen

Follow the steps given below to login through GUI:

Table 2: List of actions to login through GUI

Callout	Name	Description
1.	Web browser	Open a web browser and enter the "IP address of the AP" in the address bar. 192.168.1.1 is the default IP address
2.	User name	Enter the valid "User ID"
3.	Password	Enter the valid "Password"

Click on "Login", a successful/authenticated login will take the user to Status Overview screen.

8   Status overview screen

The screen provides the status overview of:

1.   System summary
2.   System feature
3.   Software
4.   Hardware

8.1   System summary

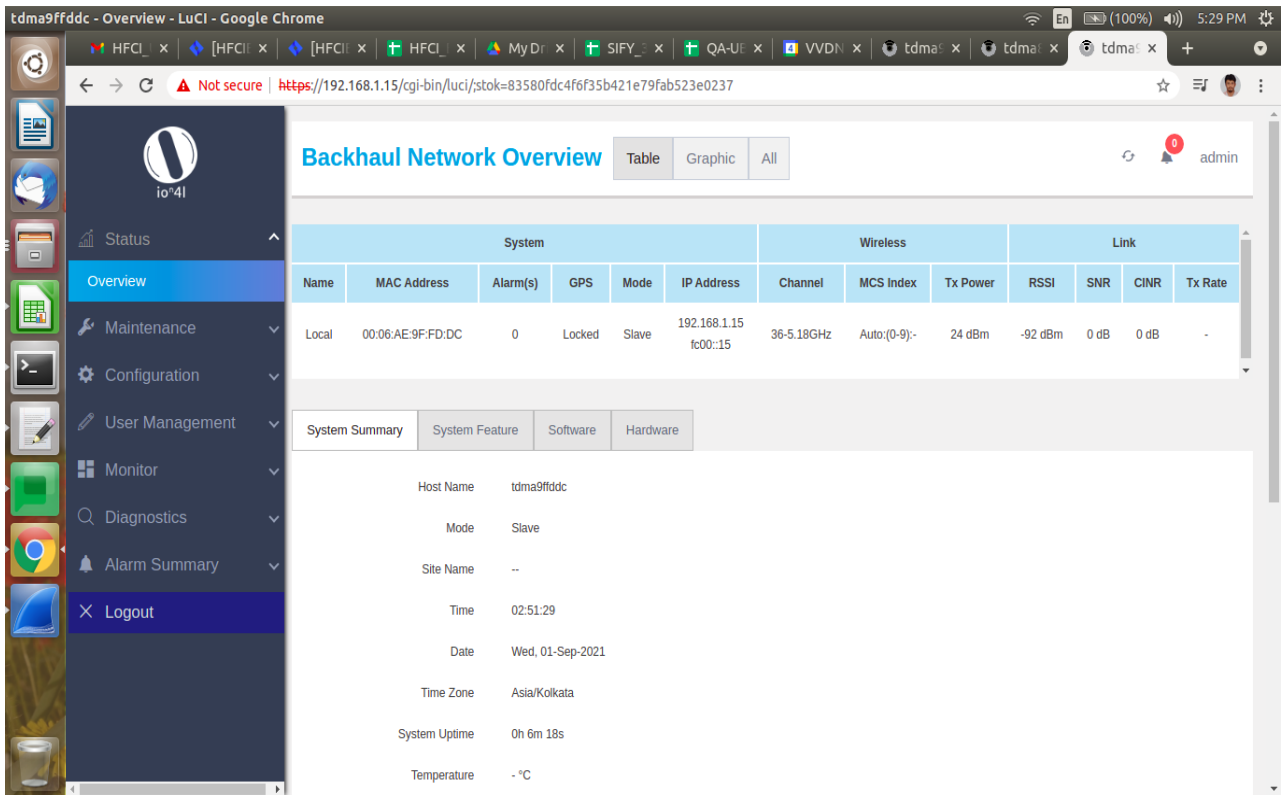A basic layout of the system summary is given below:

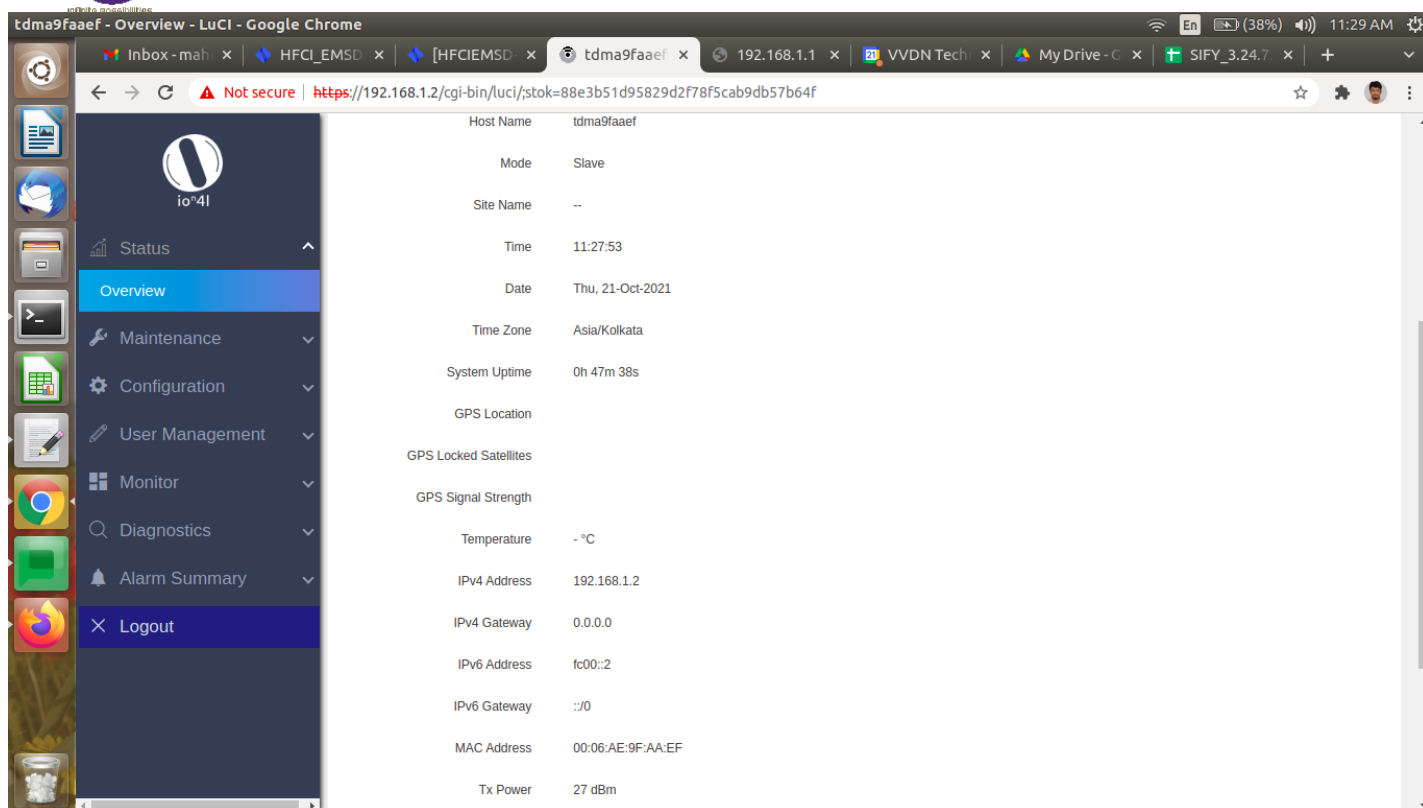*Figure 6: Basic layout of the system summary screen*

Figure 7: Basic layout of the system summary screen

Follow the steps given below to view the system summary:

Table 3: List of information displayed in the system summary

Callout	Name	Description
1.	Status	Click on the "Status" dropdown
2.	Overview	Click on "Overview" option
3.	System summary	Click on "System summary" option
4.	Hostname	Displays the "Hostname" assigned to the respective AP in the "System Configuration" screen
5.	Model	Displays the model number of the product. The same is configured with the factory settings of the device and reflects in this section on systemboot up
6.	Product Name	Displays the name of the product
7.	Current Mode	Displays the current acting mode of the AP (Thick mode or Thin mode)
8.	Current Partition	Displays the current partition in use (Primary or Secondary)
9.	Local Time	Displays the date and time details according to the time zone allocated in the "System Configuration" screen

Callout	Name	Description
10.	System uptime	Displays the time duration since the respective AP board is up and successfully running without any shutdown
11.	Average Load	Displays the average load on the device

9 Logout

Click on the logout option to terminate the user session.

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10 Installation Setup

IO Outdoor AP can be wall-mounted or pole mounted. Perform the steps discussed in below sections for the appropriate installation of indoor and outdoor APs:

10.1 Mounting of Dual Band 2x2:2 Outdoor Access Point

2x2 outdoor AP has four holes on its back side for the attachment of mounting bracket, as shown in "Figure 7: Back view of the outdoor AP" of this document. The mounting bracket is designed in such a way that the AP can be mounted on the wall as well as on the pole with the help of its attaching parts. It provides the freedom of movement to the AP even after the mounting.

1. The mounting bracket is fixed onto the mounting holes of 2x2 outdoor AP as shown in the figure below:

Figure 8: Mounting bracket attachment for Pole Mount with the 2x2 outdoor AP
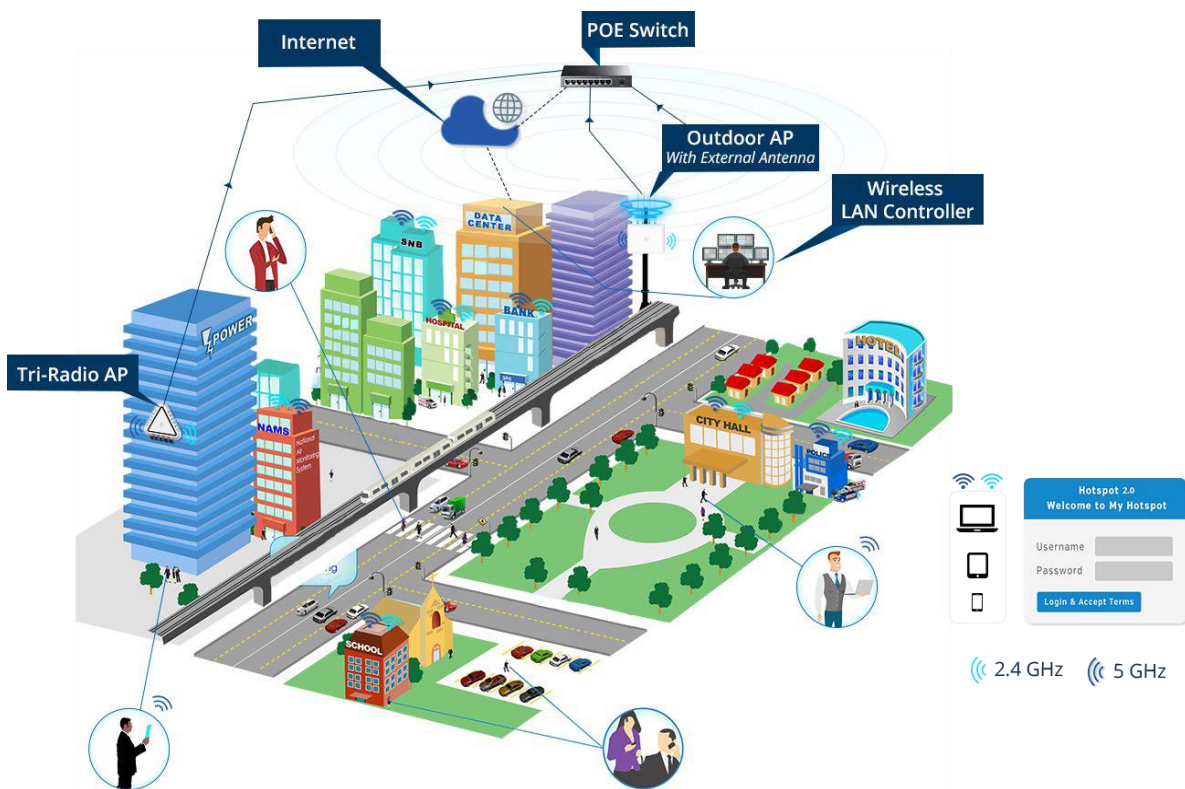
11 Use Cases

A.   Outdoor Access Point

Figure 9: Use Case Diagram of Outdoor AP

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