# **User Guide**

Ion12xi\_h/h2 Access Point





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# **1** Introduction

**ion12xi\_h** is uniquely designed to address ultra-high-density data demands and integrated 2.4 and 5 GHz 8x8:8 MU-MIMO radios. Easy Access Points configuration in the high-bandwidth environment as a 4x4 MU-MIMO in 160 MHz channel available in 5GHz band, or as an 8x8 MU-MIMO in the 80 MHz channel, without compromising peak data rates.

# 1.1 Variants

- ion12xi\_h1: IO Wi-Fi 6 Dual Band 8x8:8 Indoor Access Point with Integrated Antenna (6 dBi) [DC powering]
- ion12xi\_h2: IO Wi-Fi 6 Dual Band 8x8:8 Indoor Access Point with Integrated Antenna (6 dBi) [DC & PoE powering]

# **1.2 Federal Communication Commission Certified**

The **APs** are 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.

This 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:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.
- FCC Class B, CE
- Wi-Fi Certified Passpoint 2.0
- Wi-Fi Certified 6
- Wi-Fi Certified EasyMesh
- Wi-Fi Certified WPA3



# 1.2.1 FCC Caution

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

# **1.2.2 FCC Radiation Exposure Statement**

- This 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 complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
  - These devices may not cause harmful interference.
  - These devices must accept any interference received, including interference that may cause undesired operation.

# 1.3 Make in India

These devices complies with Make in India standards.

### 1.4 Safety

- Do not power the device during installation
- Keep away from high voltage cables
- Keep away from high temperature
- Disconnect the device from power source before cleaning
- Do not use damp cloth for wiping
- Do not power off the unit in the middle of an upgrade process
- The gland should be ground facing all the time
- Do not open the enclosure
- Fasten the device tightly
- Make sure the earthing wire is connected properly to the earthing points



# 2 ion12xi\_h (Dual Band 8x8:8 Wi-Fi 6 Indoor AP)

### 2.1.1 Front View



Figure 1: ion12xi\_h Front View

Call Out	Name	Description		
1.	2.4 GHz LED	Blinks in blue color when 2.4 GHz wireles		
		network interface comes up		
2.	Power LED	Blinks in blue color to notify the user that the		
		device is powered ON		
3.	5 GHz LED	Blinks in blue color when 5 GHz wireless		
		network interface comes up		

Table 1: ion12xi\_h Front View Description



### 2.1.2 Connector View



Figure 2: ion12xi\_h Connector View

Call Out	Name	Description	
1.	DC Jack Port	Power up using 12V adaptor	
2.	Kensington Lock	Provides extra physical security in device	
3.	Console port with USB 2.0	Helps to access the AP for administration logs and	
	Type C Connector	configuration	
4.	LAN + PoE Port (without	Power up the device by PoE adaptor and a regular	
	gland)	Ethernet Port	
5.	SFP+ Port	Connects fibre cable	
6.	USB 3.0 port Type A	Helps to transfer data faster to the storage devices	
	Connector		
7.	Reset	To reset the device	

Table 2: ion12xi\_h Connector View Description

# 2.1.3 Back View



Figure 3: ion12xi\_h Back View





Call Out Name		Description
1.	Mounting screws	Helps in device mounting
2.	Ceiling Plate	Helps in mounting device to the ceiling
3.	Mounting Bracket	Helps in device mounting

Table 3: ion12xi\_h Back View Description

# 3 Connect to Thick Access Point and Log In

The user can connect to the access point's web management interface to view or change its LAN and wireless access settings. This section explains how to login through GUI for ion4x\_HMR as an example.

# 3.1 Login through GUI

This is the first 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.

# 3.2 Dashboard

On the successful device set up and login the user can view the Dashboard with the following options in the left pane

- Status
- System
- Network
- Wi-Fi Schedule
- Statistics
- Diagnostic
- Switch AP Mode
- Logout





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Figure 4: Device Dashboard

# 3.3 Status

The **Status** page provides a summary of the system, software, hardware, and wireless configurations under **Overview**.

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or Logon .	1. julieren	Di Die Ga	

Figure 5: Status Screen

S.No.	Field	Description	
1.	System Summary	Gives a brief overview of both the device and the software	
		settings such as current mode from a bird's eye view.	





2.	Software	Gives the details regarding the software.
3.	Hardware	Provides current hardware configuration details.
4.	Wireless Summary	Gives a succinct overview of the wireless specifications.

Table 4: Status

### 3.3.1 System Summary

**System Summary** provides a detailed overview of the system specifications including **Model Number**, **Product Name**, **Uptime** along with a basic insight to the **Memory Allocation** and **Network Specifications** (IPv4 and IPv6).

Hostname		HFCL
Model		ion4xi_HMR
Product Name		HFCLION4xi_HMR
Current Mode		Thick Mode
Current Partition		Secondary
Local Time		Mon May 08 2023 14:46:31 IST
Uptime		1h 35m 51s
CPU Load Average	5 min(%)	1.55

#### Figure 6: System Summary

S.No.	Field	Description	
1.	Hostname	Current hostname of the software as configured	
2.	Model	Model of the Home mesh router (HMR) device	
3.	Product Name	Product name of the model	
4.	Current Mode	The current mode of the software (either Thick or Thin mode)	
5.	Current Partition	Primary or Secondary	
6.	Local Time	Current local time as per the software.	
7.	Uptime	The time duration from the last downtime period	
8.	CPU Load Average 5	Gives the current CPU Load Average of the last 5 minutes	
	min (%)		

Table 5: System Summary



Fram	101.8 M0 / 412 564 M5 (24W)
Network	
Puil Address	
	Assess: 10-72-3.199
	terrentiscen Sin Laws
	General 10,4181
	DNS 2: 0.0.0.0
	DNS 2: 10.42.0 1
	Convected: 21.54x 48x
Dutt Arbitrams	All data method

Figure 7: Memory & Network Allocations

S.No.	Field	Description
1.	Memory	Memory occupied shown in percentage.
2.	Network	Gives information on IPv4 address and IPv6 network specifications
		such as current interface, gateway, and IP address, etc.
3.	IPv4 Address	Displays the allocated IPv4 address
4.	IPv6 Address	Displays the allocated IPv6 address

Table 6: Memory & Network Specifications

### 3.3.2 System Software

The **Software** option provides the **Current Firmware Version** of the device and an **Alternate Firmware Version**.

	Status		
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#### Figure 8: Software Specifications



S.No.	Field	Description
1.	Current Firmware Version	Current firmware version of the device.
2.	Alternate Firmware Version	Alternate firmware version that user can update to.

Table 7: Software Specifications

### 3.3.3 System Hardware

The **Hardware** option provides the specifications including the specific device deployed like **Hardware Version**, **Device Type**, **MAC Address** of the particular device and its **Serial Number**.

System Summary	Software	Hardware	Wireless Summary
Hardware Version			2.0
Device Type			ion4xi_HMR
Serial Number			2205770100018
MAC-Address			00:06:AE:FB:FC:3F

#### Figure 9: Hardware Specifications

S.No.	Field	Description
1.	Hardware Version	Hardware version of the device.
2.	Device Type	Family of device types that this device belongs to (different from
		Product Name).
3.	Serial Number	Serial number (device ID) of the device.
4.	MAC Address	MAC address of the device.

Table 8: Hardware Specifications



### 3.3.4 Wireless Summary

The **Wireless Summary** provides specification such as **SSID**, **Mode** (Master/Client), **Channel**, **BSSID**, **Bitrate** and **Encryption** enforced on the wireless frequency bands of both Radio 2.4 GHz 802.11b/g/n/ax (Wi-Fi0) and Radio 5 GHz 802.11a/n/ac/ax (Wi-Fi1) are depicted.

1400	and the second second second	and the second	1000			
dio	2.4 GHz 802.11b/	dyunax (Mi-+	10)			
	\$540	Mode	Channel	Rittate	BS60	Khurgptten
1	HECHION	Marine	6 (2,417 044)	17736an	1000/HEFR/FC30	1094-PGR (CCMP)
	CasyMontOlian	Manine	6(2.431(049)	57736401	NON-ARTIFIC DA	WW2.05K (CCMP)
į.	Katykheste	Manifed	6 (2-417 GHz)	S71 Maria	10:06 AE FB FC 20	Mary ble (OCPB)
dio	5 GHz 802.11a/n/i	aciax (Wi-Fi	1)			
dio	5 GHz 802.11a/min 550	aciax (Wi-Fi Mode	1) Chartour	Bitrata	85560	Encryption
dio	5 GHz 802.13a/min ssio HncLoli	actax (Wi-Fi Mode	1) Dama 146 (5.745 GHz)	Elitrada 1201 Minim	BESSED DOUGLAIR PERFECTION	Exception WW Pok (COMP)
oita	5 GHz 802.11a/min 550 HPCLION EarlyMeet	actax (MI-Fi Mode Name Netter	1) Dama 146 (5.745 GHz) 146 (5.745 GHz)	Bitrate 1201 Menn 1201 Menn	BSSID DO DE AD PRIFE DE DE DE AD PRIFE DE	Decryption WWW PDK (CCMP) WWW/ PDK (CCMP)

#### Figure 10: Wireless Summary

S.No.	Field	Description
1.	Radio 2.4 GHz (Wi-	Depicts the current configuration of the Radio 2.4 GHz 802.11b/g/n/ax
	FiO)	(Wi-Fi0) such as the SSIDs created of the devices, their respective
		modes (Client / Master) and the encryption enabled, respectively.
2.	Radio 5GHz (Wi-Fi1)	Depicts the current configuration of the Radio 5 GHz 802.11a/n/ac/ax
		(Wi-Fi1) such as the SSIDs created of the devices, their respective
		modes (Client / Master) and the encryption enabled, respectively.

Table 9: Wireless Summary

# 3.4 System

Allows the end users to configure the system settings for the device. The system has the following 6 tabs. Enables the users to configure the system settings like **Administrator Password**, **Factory Reset** and to apply updated firmware with backups.

- System Settings
- Set AP Password
- Backup/ Upgrade Firmware
- Reboot



- Factory Reset
- Syslog

# 3.4.1 System Settings

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had	NUT Server 1 of "			
Network		1-001499	14	
enres Contra				
- extent/e				STATUTE STATE

Figure 11: System Settings

Users can

- configure the **Hostnames**
- enable syncing local time with browser and **Time zones**
- enable **NTP Client** where a maximum of 5 NTP servers can be enabled
- populate **NTP servers List** can be populated according to the user specification

S.No.	Field	Description
1.	Local Time	The current local time according to the software is displayed
		(which can be synchronized with the local time of the browser if
		required).
2.	Hostname	The host name of the software can be configured.
3.	Time zone	Time Zone of the user can be configured here.
4.	Time	Allows user to synchronize computer clock time sources in the
	synchronization	network.
5.	Enable NTP Client	Users can opt for time synchronization using this button.
6.	NTP Servers List	If time synchronization has been enabled, then users can choose
		and select from the NTP Servers List as per user's requirement.
7.	Save & Apply	All changes to the configuration will be saved here and then
		applied.
8.	Reset	Any configuration changes made but not saved and applied will
		be reset.

Table 10: System Settings



# 3.4.2 Set AP Password for thick AP

The user can configure the Administrator password to access the devices.

	Login Password		
Shine -	Contract (	at 0	
Stypiere -	fane Pressent *	at 0	
press bolings	Option Paramett <sup>+</sup>	at 0	
- Alt (			
edup//Appade Ferrovare			Trans & Appendix
riboor			and the second s

#### Figure 12: Set AP Password Screen

S.No.	Field	Description
1.	Set AP Password	Changes the administrator password for accessing the device.
2.	Login Password	Allows login configurations to be made and applied as per user's specifications.
3.	Current Password	Current password set to access the device.
4.	New Password	New password that the user wants to specify for the device access.
5.	Confirm Password	Password confirmation.
6.	Save & Apply	All changes to the configuration will be saved here and then applied.
7.	Reset	Any configuration changes made but not saved and applied will be reset.

Table 11: Set AP Password

# 3.4.3 Backup/ Upgrade Firmware

### **3.4.3.1** Backup/ Restore

- Enables users to perform actions such as restoring configuration files by uploading previously generated backup archives.
- Users can also create an archive of the current configuration files which can be used to implement backups in case of failovers.



# 3.4.3.2 Firmware Upgrade

The firmware is stored in flash memory and can be updated with new versions to include new features or to modify the existing one. This AP has two partitions. The firmware version is always uploaded in the alternate partition to keep the current firmware image restored which is located in the current partition of access point. When we upgrade new firmware, the existing firmware will become backup firmware. If any issues are found in new firmware, the backup firmware will be booted.

	Backup operations		
l Status - Frances Normal Streps Lei Alf Personna Status (Streps)	Backup / Finisher Chr. Terrere and a landow of the server and function backup () () () () () () () () () () () () ()	ning prime lan.	
laduuri factory Henni Controp , Alathanuth 	Opprade new firmware image that two anings to real to control conjugate two entrops <b>5</b> recent forware (Chemick) to to reason	a serve mar.	

#### Figure 13: Backup/Upgrade Firmware

Save the software file in the system drive of your laptop or system. Refer the image below:

Home Share	View			
🚽 👻 🕇 🦰 > This P	PC > New Volume (D:) > Official > HFCL > Project	ts → WIFI → UBR → Jio → Software	image	
🧧 Project Software	* ^ Name ^	Date modified	Туре	Size
Official	HFCL_TDMA_2.0.10.12	08-01-2019 02:32	12.File	25,212 KB
👷 HECL				
BSNL Microwave tendo	e ve			
Amit document	1			
Project Data	9			

S.No.	Field	Description
1.	Backup/Upgrade Firmware	Current firmware of the device can be upgraded and
		backups of the same can be created.
2.	Backup Operations	Enables users to perform backup operations.
3.	Backup/Restore	Allows user the feature of creating backups of current
		configuration files and restoring the same.

Figure	14:	Upload	Archive
<u> </u>		'	





4.	Generate archive	Downloads a tar archive of the current configuration files if user wishes to create a backup.
5.	Restore backup-Choose File	Any previous backup can also be restored by uploading a
		previously generated backup archive.
6.	Upload archive	Users can upload the backup archive which needs to be
		restored.
7.	Upgrade new firmware image	Firmware image to be uploaded here for firmware upgrade.
8.	Keep Settings	Check this to retain the current configuration.
9.	Upload Firmware- Choose File	Upload the firmware image desired.
10.	Upgrade Image	Upgrade the current firmware image.

Table 12: Backup/Upgrade Firmware

# 3.4.4 Reboot

Reboot restarts the device with existing configuration. The user can change the firmware when the device is rebooted with different partitions. Based on the selected partition, the corresponding firmware will be loaded into the device as working firmware.

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succession from All with	Status			
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llysien Settings Set AP Messeint	÷	Pressy	234.00	Research to the Participation active)
Baciliup / Opgrade Fillroware	-			
Antas				

#### Figure 15: Reboot Screen

S.No.	Field	Description
1.	Reboot	Device can be rebooted if user desires.
2.	Partition	Displays the partition number.
3.	Status	Displays status of the device system such as Primary, Secondary.
4.	Firmware Version	Displays the current firmware version of the specific partition.
5.	Actions	Enables users to reboot to this specific partition.

Table 13: Reboot



### 3.4.5 Factory Reset

The device has factory assigned settings and configurations on deployment. The user can set the device to the same from this screen. The device will be configured back to factory settings and the existing settings and configurations will be discarded. It is recommended to take backup before setting the device to factory reset.

1993222404,00091223434	Factory Reset 's which is 14 and other to being striked entropy. Name club. Yorkeen Facing Reset'
d Time -	Parton Pacoro Heart
A System -	
Space Serves	
Set AP Persent	
Radiug   Lögslade Firmware	
Period	

#### Figure 16: Factory Reset Screen

S.No.	Field	Description
1.	Factory Reset	Enables the users to make the device revert back to the factory settings (default settings).

Table 14: Factory Reset

### 3.4.6 Syslog

This page enables users to create their own syslog.

0	Sys	log			
-	1445	(a) and (a)	-		
S Steene	100	and the second			
P System	100			_	
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N.F. Schedule.	-			_	
Naturitus	100		-		Treast Design
Dispusie	100		literite		
2 Saint Aff Incis	-				
O Laster					







S.No.	Field	Description
1.	Logout	Users can log out of this application (GUI).
2.	Syslog	Provides the user with the system logs.
3.	Log Buffer Size	Create buffer size with range of 16 to 1024 kB, with a default value of 1024 kB.
4.	Log Server IP	Server IP where the syslog are to be rendered. Both IPv4 and IPv6 can be configured.
5.	Log Server Post	Users can specify the port within the range of 0 to 65353; default port as 514.
6.	Log Level	Logs all messages with a level greater than or equal to the selected one. For example, setting the priority threshold to DEBUG (lowest priority) causes all messages to be logged.

#### Table 15: Syslog

Enables users to create their own syslog according to the user specified parameters, such as

- Log Buffer Size
- Log Server IP
- Log Server Port
- Log Level
  - o Critical
  - o Debug
  - o Info
  - o Notice
  - Warning
  - o Error
  - o Alert
  - Emergency

S.No.	Field	Description
1.	Alert	Logs which need the users to be informed about something or alerted.
2.	Info	Logs pertaining to information.
3.	Critical	For critical logs of high priority.
4.	Debug	Logs related to debugging.
5.	Notice	Notification related logs.
6.	Warning	For logs which are warning related.
7.	Error	For error related logs.
8.	Emergency	For highest level priority concerns.

#### Table 16: Log Level

Logs all messages with a level greater than or equal to the selected one. For example, setting the priority threshold to DEBUG (lowest priority) causes all messages to be logged.



### 3.5 Network

The Network tab, has been further segregated into 5 divisions:

- Wireless
- Interfaces
- Easy Mesh Configuration
- DHCP Server configuration
- Static Routes



Figure 18: Network Screen

# 3.5.1 Interfaces

The Interface tab depicts the Interface overview and the Ethernet Port status.

formularly.		Statue		Actions	
	LAN	MAC-ANNIHARI DOGENE FEIFC 3F		10.00	
# 452	1 = 1 = 1 = 1 (rm)	Te: (LT2 MB (20073 Pars.) Te Drop. 0 Pars. He Drog: 0 Pars.			
		8998 1043 0 1003 K			
hemet Port	Status Link Denot	994 10 10 10 10 10 10 1	Speed		Dagetere
hernet Port	Status Link Denot	994 10 10 10 10 10 10 1	Rgeneri 		Digitive

Figure 19: Interface Screen





S.No.	Field	Description
1.	Interface Overview	Gives information of the interfaces of the device.
2.	Network	Gives the interface name.
3.	Status	Displays the interface specific information.
4.	Actions	Allows users to make configuration changes pertaining to the
		interface.
5.	Ethernet Port Status	Displays the current ports of the device.
6.	Port	Gives the port name.
7.	Link Detect	Informs if Link Detect has been enabled or not and its respective
	Speed	speeds.

#### Table 17: Interface

Information regarding the network connected, its status (MAC address, Transaction information and IPv4) is displayed. Users can also edit the interface and can configure the same according to their requirements.

# **3.5.1.1** Network Interfaces – LAN

In this Interface page of setting, user can configure the network interfaces. It has two subdivisions:

- General Setup
- Management VLAN Settings

#### 3.5.1.1.1 Network Interface: General Setup

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Gererat Sala	Mainpet	eri MAN Simul		
	Present	CHCPytholmell	~ 0	
	Over T24/P	Code	- 0	

#### Figure 20: General Setup Setting

S.No.	Field	Description
1.	Network Interface	Enables the users to configure network interfaces.
2.	Common Configuration	Gives the current configuration and enables users to re-
		configure them.
3.	General Setup	General configurations.
4.	Protocol	Protocol of the interface.
5.	Dual Stack	Enable/Disable dual stack of the interface.

Table 18: General Setup



# 3.5.1.1.2 Network Interface: Management VLAN Settings

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Common Cor	figuration		
General Setup	Management VLAN Settings		
	Jone Deitre	0	
			Constant of the

#### Figure 21: Management VLAN Setting

S.No.	Field	Description
1.	Network Interface	Enables the users to configure network interfaces.
2.	Common Configuration	Gives the current configuration and enables users to re- configure them.
3.	Management VLAN Settings	Configuration pertaining to Management VLAN settings.
4.	Status	Enable/Disable management VLAN.
5.	Save & Apply	All configuration changes made will be saved and applied.
6.	Reset	All configuration changes made but not saved will be discarded.

Table 19: Management VLAN Setting

# 3.5.1.1.3 Ethernet Port Status

Ethernet Port Status tab displays the Link detection & the Port Status (Speed and Duplex valve).

Ethernet Port	Status		
Port	Link Detect	Speed	Duplex
Eth0	No	8	8
Eth1	Yes	2000Mb/s	Fut

#### Figure 22: Ethernet Port Status

S.No.	Field	Description
1.	Ethernet Port Status	Displays the status of ethernet ports and their current
		configurations.





2.	Port	Name of the ethernet ports.
3.	Link Detect	Displays if link detect has been enabled or not.
4.	Speed	Displays the speed of the port.
5.	Duplex	Shows duplex of the port (Half or Full).

Table 20: Ethernet Port

# 3.5.2 Wireless

In this page, User can make changes in the existing configuration and can make new SSIDs of devices under the Radio bands.

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W	ireless Overview	
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#### Figure 23: Wireless Overview Screen

S.No.	Field	Description
1.	Wireless Overview	Allows the wireless settings to be configured as per user's
		requirement.
2.	Radio 2.4 GHz	Shows the SSIDs of Radio 2.4 GHz
3.	Radio 5GHz	Shows the SSIDs of Radio 5 GHz
4.	Add SSID	A new SSID can be added to the HMR device.
5.	Edit	Current configuration can be edited here.
6.	Remove	The specific SSID can be removed here.

#### Table 21: Wireless

- Detailed overview of wireless configurations are displayed for both Radio 2.4 GHz 802.11b/g/n/ax (wifi0) and Radio 5 GHz 802.11a/n/ac/ax (wifi1).
- Users can also make changes in the existing configuration and can also add new SSID of devices under the two radio bands: unlike the brief display of configuration under the System Tab of Dashboard. (Refer to Figure: 7 Wireless Summary Screen)
- On clicking "Add SSID," user gets two sets of setting configuration





- o Radio Configuration
- SSID Configuration

### 3.5.2.1 Radio Configurations

In Radio Configurations settings, there are two sub-categories: General Settings & Advanced Settings

### 3.5.2.2 Radio Configuration: General Settings

- Radio Status
- Transmit power
- Mode
- Channel width
- Channel

Radio Configuration				
Germal Setup Advan	ed Settings			
Pladei Status	• Enable	÷	0	
Transmit power	• [15		0	
Mode	* Ilasy	*	0	
Channel Width	ADMH2 and channel percer	٣	0	
Changel	· Auto		0	

Figure 24: Radio Configuration General Settings

S.No.	Field	Description
1.	Wireless Network	Allows the wireless settings to be configured as per user's
		requirement.
2.	Radio	General Settings
	Configuration	
3.	Radio Status	Enable the radio status to make SSID visible to allow users to
		connect.
4.	Transmit Power	Supported range from 6dBM to 23dBM.
5.	Mode	Wireless standard to be selected which is compatible with the device.
6.	Channel Width	Channel bandwidth in which radio needs to operate
7.	Channel	Selecting 'Auto' will automatically select one of the available
		channels.

Table 22: Radio Configuration General Settings



# 3.5.2.3 Radio Configuration: Advanced Settings

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AIC OF DHA	2545	- 0	
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Res Chief Allower Datus,"	Deate	- 0	

Figure 25: Radio Configuration Advanced Settings

S.No.	Field	Description
1.	Wireless Network	Allows the wireless settings to be configured as per user's
		requirement.
2.	Radio	Advanced Settings
	Configuration	
3.	MU-MIMO	By enabling MU-MIMO, multiple clients connected to the access point
		will be able to send acknowledgement responses (ack)
		simultaneously, thus saving airtime. This ultimately improves network
		throughput and efficiency.
4.	TWT	It allows devices to negotiate when and how often they will wake up
		to send or receive data. TWT increases device sleep time and, in turn,
		substantially improves battery life.
5.	UL OFDMA	The total bandwidth is divided into several bundles of sub-carriers
		(denoted by resource units (RUs)) and each station transmits its UL
		frames through the allocated RU.
6.	DL OFDMA	The total bandwidth is divided into several bundles of sub-carriers
		(denoted by resource units (RUs)) and AP transmits its DL frames
		through the allocated RU.
7.	BSS Color	This helps mitigate overlapping Basic Service Sets (OBSS). In turn, this
		enables a network to more effectively – and concurrently – transmit
		data to multiple devices in congested areas.
8.	Tx/Rx Antenna	Users can select Tx/Rx Antenna Chain Mask 1x1 or 2x2.
	Chain Mask	
9.	Country Code	Standard Country code.
10.	Max Client Allowed	Enable Max Client Allowed to use Max Client Allowed
	status	

Table 23: Radio Configuration Advanced Settings



# 3.5.2.4 SSID Configurations

In SSID Configuration page, user gets four further types of settings to configure SSIDs.

- General Setup
- Advanced Settings
- Wireless Security
- MAC Filter

#### 3.5.2.4.1 SSID Configuration: General Settings

nerar setup	Wretess 3	security MAC-F-Ille	Advanc	eo semogs
34	AP Status *	Enable		0
	SSID*			0
	Mode *	Acoms Point	v	0
	Network *	LSN	÷	0
01	Hide <u>SSID</u> *	Deable	÷	0

#### Figure 26: SSID Configuration General Settings

S.No.	Field	Description
1.	SSID Configuration	General Setup
2.	VAP Status	Select enable/disable to change the VAP status.
3.	SSID	Users can give the SSID of the device.
4.	Mode	In Access Point mode, Device can be connected to a wired network and transform the wired access into wireless that multiple devices can share together, especially for a home, office, or hotel where only wired network is available.
5.	Network	If DHCP Server is enabled, then the network will be NAT if DHCP Server is disabled then the network will be LAN.
6.	Hide SSID	Users can select enable/disable to change the Hide SSID status.

Table 24: SSID Configuration General Settings





#### 3.5.2.4.2 SSID Configuration: Wireless Security

Users can choose the type of network authentication (data encryption) that is required to connect to the SSID.

		5 (ALC)		100	
oneral Setup	Wireless 5	security	MAC-Filler	Advanced Settings	
	Encryption *	No Frid	number.	~ 0	
	and products	110.42170	Thereas	•	

Figure 27: SSID Configuration Wireless Security

S.No.	Field	Description
1.	SSID Configuration	Wireless Security
2.	Encryption	Enables users to specify the encryption type to be set.

Table 25: SSID Configuration Wireless Security

#### 3.5.2.4.3 SSID Configuration: MAC Filter

Users can select disable/Allow all listed/Allow all except listed.

	-	A REAL PROPERTY.		
seneral Setup Wireless	secunty	MAC-Filler	Advanc	ed Settings
MAC-Address Filter	disable		~	0

Figure 28: SSID Configuration MAC Filter

S.No.	Field	Description
1.	SSID Configuration	Mac Filter
2.	MAC-Address Filter	Can be enabled or disabled as per user requirements.

Table 26: SSID Configuration MAC Filter



### 3.5.2.4.4 SSID Configuration: Advanced Settings

ieteral Selup - Wreters I	Security MACFREE	Advinced Settings
Client Isolation	0 0	
HTS Status	Double	~ 0
DTM Interval*	1.	0
Beacon Interval *	300	0
Wi-Fi Multimedia	21404	~ 0
Mox Client Line	128	0
-Fi Multimedia Power Seve	finante	~ 0
VLAN Status	Dube	~ 0
Option 82	Diate	~ 0
Optico 18	Distilie	~ 0
Rate Line	Osable	~ 0
ATF Enable	Ocable	~ 0
TX STBC	Dividit .	~ 0
HX STBC	Doole	~ 0
Number of Spatial Direarm	1	0

### Figure 29: SSID Configuration Advanced Setting

S.No.	Field	Description
1.	SSID Configuration	Advanced Settings
2.	Client Isolation	Prevents client-to-client communication
3.	RTS Status	Users can enable RTS Status to configure RTS.
4.	DTIM Interval	Specify the period of time to wake up clients from sleep mode to receive traffic at the right time. Allowed range is from 1ms to 255ms.
5.	Beacon Interval	Specify the time interval in which beacon packets have to be transmitted. Allowed range is from 100ms to 300ms.
6.	Wi-Fi Multimedia	Enabling the WMM will control the upstream traffic flow from Wi-Fi device to AP and downstream traffic flow from AP to Wi-Fi device.
7.	Max Client Limit	Supported range from 1-128.
8.	Wi-Fi multimedia Power Save	WMM-Power Save increases the efficiency and flexibility of data transmission. Specifically, the client device can doze between packets to save power, while the access point buffers downlink



		frames. The application chooses the time to wake up and receive data packets to maximize power conservation without sacrificing Quality of Service
9.	VLAN Status	VLAN status enable/disable, if VLAN will be enabled then VLAN value 1 will be set by default.
10.	Option 82	This will add client VLAN ID in Option82 field (IPv4).
11.	Option 18	This will add client VLAN ID in Option18 field (IPv6).
12.	Rate Limit	Enable Rate Limit per VAP or Rate Limit per Client to select
		Upload Limit and Download Limit.
13.	ATF Enable	Enable ATF to use ATF feature.
14.	TX STBC	Space time block coding (STBC) transmits multiple copies of one data flow in wireless communication. STBC uses many antennas to produce multiple receive versions of data, improving data transmission reliability.
15.	Number of spatial streams	Spatial Streams 1-2 is supported.

Table 27: Radio Configuration Advanced Settings

# **3.5.3** Easy Mesh Configuration

A wireless mesh network serves as a network of radio nodes organized in a mesh topology. All APs participating in mesh topology does not need to have a wired connection for backhaul connectivity and only one root AP serves that purpose.

Mesh configurations require access points to operate in two operating modes as follows:

- Controller AP: Controller AP have wired connections, for example, Ethernet backhaul to a wired network and to cNMS.
- Agent AP: Repeats wireless signals to extend range without being connected with cable to Access Point, or with clients.

Mesh configuration allows access points to connect with each other in mesh topology. An access point (Controller AP) is connected to the wired network with the use of wireless connections over the 802.11 radio backhaul and other agent access points act as repeaters in mesh topology. In case of a mesh node failure, the surrounding nodes automatically re-connect and resume service without downtime. Nodes identify the best next hop and connect with it automatically.

Energine 7	frem	199	
Carloon?	Agent AP	-	
Agent Master 1	Paper And Long-	12	
week	wes o		





Figure 30: Easy Mesh Configuration

S.No.	Field	Description
1.	Easy Mesh	Users can configure easy mesh configuration.
	Configuration	
2.	Enable/Disable	Mesh mode can be enabled/disabled.
3.	AP Mode	AP Mode to be selected
4.	Agent Mode	Agent Mode to be configured.
5.	WPS	Enable wifi-protected setup by choosing either soft or hard WPS
		(software or hardware respectively).

Table 28: Easy Mesh Configuration

# **3.5.4 DHCP Server Configuration**

The AP itself can act as a DHCP service provider for the connected clients and configuration for the same is executed from this screen. A basic overview of the screen to enable thick AP as DHCP server (IPv4) is given below:

DHCP Configuration		
Server Settings		
Cananal Settings		
DHCP Server Dustine	~ 0	
		Sam & Argey Firmer

Figure 31: DHCP Configuration

S.No.	Field	Description
1.	DHCP Configuration	DHCP protocol settings can be configured as per user
		requirements.
2.	Server Settings	DHCP server settings can be configured.
3.	DHCP Server	Can be enabled/disabled.

Table 29: DHCP Configuration



# **3.5.5** Static Routes

Users can specify the interface and gateway through which a certain host or network can be reached in the Route Configuration tab. Both static IPv4 and static IPv6 routes can be configured by the user. Before clicking the **Add** Button, the page looks like:

	Routes				
Interface	Target	1944-Netmasik	iPv4-Galaway	Metric	NTU
	Host-IP or Network	# sarper is a setwork			
This section row	NUMBER OF CONTRACT				
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Static IPv6	Routes				
inierlace	Target		(Pv6-Gatewey	Metrix	NTM
	(Pv6-Automa or Network (	cion).			

Figure	32:	Static	Routes	(1)
--------	-----	--------	--------	-----

S.No.	Field	Description
1.	Routes	Specifies over which interface and gateway a certain host or network can be reached
2.	Static IPv4 Routes	All static IPv4 routes are displayed
3.	Add	New static IPv4 routes can be added by the end-user.
4.	Static IPv6 Routes	All static IPv6 routes are displayed.
5.	Add	New static IPv6 routes can be added by the end-user.

Table 30: Static Routes\_1

After clicking **Add** Button, the page looks like:

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Non and the	Sarget (Poli-Address or n contains to valuet get	Network (CR2P)	Pet-Gamery	Metric	ыти

#### Figure 33: Static Routes\_2

S.No.	Field	Description
1.	Routes	Specifies over which interface and gateway a certain host or
		network can be reached.
2.	Static IPv4 Routes	New static IPv4 routes are added.
3.	Interface	Interface, along with the Host-IP, IPv4 target, gateway and MTU
		can be configured by the end-user.
4.	Static IPv6 Routes	New static IPv6 routes are added.
5.	Interface	Interface, along with the Host-IP, IPv6 target, gateway and MTU
		can be configured by the end-user.
6.	Add	More routes can be added as required.
7.	Save & Apply	All new configuration changes will be applied after being saved.
8.	Reset	All configuration changes which have not been saved and
		applied will be discarded.

Table 31: Static Routes\_2





### 3.6 Wi-Fi Schedule

Wi-Fi schedules can be created and viewed by the user as per their own configurations. It has two categories: **Create Schedule & View Schedule** 

# **3.6.1** Create Schedule

The current status of the Wi-Fi on the AP is displayed. The user can enter the Wi-Fi Schedule profile name. This profile name should not be the same as an existing profile name. This is not case sensitive.

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	Schedule Evends	
Sender Cardoon	The in the second	
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		Section 2 Courses
Very furbane		

#### Figure 34: Create Wi-Fi Schedule

S.No.	Field	Description
1.	Wi-Fi Schedule	Wi-fi schedule can be configured by the end-users.
2.	Current Wi-fi Status	Can configure the current wi-fi status (enables/ disabled)
3.	Schedule Events	Event name to create profile.
4.	Add	To add a schedule event.
5.	Save and Apply	Changes will be applied after saving.
6.	Reset	All changes not saved and applied will be discarded.
7.	Unsaved Changes	All changes unsaved for configuration.

Table 32: Wi-Fi Schedule

# 3.6.2 View Schedule

Any schedule created will be populated on the screen under the 'View Schedule' Tab.



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2 Status				
🛃 flysten -				
2. Network	6			
Parental Cartrols	1			
W-FI Schedule	8			
Dean Schellule				
Max School &				

#### Figure 35: View Wi-Fi Schedule

S.No.	Field	Description
1.	View Schedule	Any schedule created will be displayed.
2.	Job Name	The name of job schedule.
3.	Stop Time	Time at which the schedule will stop.
4.	Start Time	Time at which the schedule will start.
5.	Days	Days the job schedule will be run.
6.	Unsaved Changes	Any changes unsaved.

Table 33: View Wi-Fi Schedule





# 3.7 Statistics

All statistical information such as reports, and statistical graphs will be rendered to the user. It includes Realtime Graphs & Reports.

# **3.7.1** Realtime Graphs

The real time load graph shows the CPU load of last 3 min and the graph is refreshed at every 3 sec intervals. In addition to the displayed graph the user can find the average and the peak CPU load values of the respective AP. A basic overview of the Real-time load graphs screen is given below:

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#### Figure 36: Real Time Load

S.No.	Field	Description	
1.	Statistics	Statistical information is rendered on this page.	
2.	Realtime Traffic	Real time traffic is rendered to end-users in the form of graphs.	
3.	Realtime Load	Real time load is depicted by the total CPU consumed by all the processes.	

Table 34: Realtime Load



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See	38	34
atos (R. kBis)		
anis (K kBis)		

Figure 37: Real Time Traffic

S.No.	Field	Description
1.	Statistics	Statistical information is rendered on this page.
2.	Realtime Graphs	All real time graphs pertaining to different fields are rendered.
3.	Realtime Traffic	All real time traffic pertaining to different fields are rendered.

Table 35: Realtime Traffic

# **3.8** Reports

All the reports generated by the user can be downloaded for their perusal.

<b>W</b>	Report Download	
HPOLIONHU_HMP1+2.0-4.24	Report type - Select w	
í Status 🗸	Generaliz Report	
🕨 System 🔍 🗸		
L Network 🔍		
arental Controls 🔍 🗸		
W-Fi Schedule ~		
tatistics ^		
Realtime Graphs		
Report		
Diagnostic ~		
5 Switch AP mode		

Figure 38: Report





S.No.	Field	Description
1.	Report Download	Reports can be downloaded by end-users in tar format for their
		perusal.
2.	Report Type	Report type can be selected as required.
3.	Generate Report	Reports are generated and automatically downloaded.

Table 36: Reports

# 3.9 Diagnostics

All the diagnostics services will be rendered to the user:

- Routes
- System Log
- Kernel Log
- Tools
- Associated stations

# **3.9.1** Routes

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-	11.0			100
			-	

Figure 39: Routes Tab

S.No.	Field	Description
1.	Routes	Routing routes are rendered for end-users.
2.	ARP	Address Resolution Protocol are displayed.
3.	Active IPv4 Routes	Current configured active IPv4 routes are displayed.
4.	Active IPv6 Routes	Current configured active IPv6 routes are displayed.

Table 37: Routes





### 3.9.2 System Log

This screen is provided to view the AP logs if the user faces any issue or wants to view the back-end logs. Only new logs are shown in this screen. However, old logs are stored in the database but will not be shown in this screen.

A basic overview of the System Log screen is given below:

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Figure 40: System Log Tab

S.No.	Field	Description
1.	System Log	System specific logs are rendered to the end-users.

Table 38: System Log



# 3.9.3 Kernel Log

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Figure 41: Kernel Log Tab

S.No.	Field	Description	
1.	Kernel Logs	Kernel Logs are displayed to the end-users.	

Table 39: Kernel Log

#### 3.9.4 **Tools**

S.No.	Field	Description	
1.	Tools	Enables end users to debug and troubleshoot	
		as per arising needs.	

Table 40: Tools

### 3.9.5 Associated Stations

The list of connected clients along with the relevant information in respective information columns is populated in this screen. A basic overview of the screen to show connected clients is given below:

S.No.	Field	Description
1.	Associated Stations	Through this, end users can see the
		listings of the Client device details
		which are connected to the
		network.

Table 41: Associated Stations





# 3.10 Logout

S.No.	Field	Description	
1.	Logout	Users can log out of the GUI after editing	
		configuration according to their specific	
		requirements.	

Table 42: Logout



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HFCL is a leading technology company specializing in creating digital networks for telcos, enterprises, and governments. Over the years, HFCL has emerged as a trusted partner offering sustainable high-tech solutions with a commitment to provide the latest technology products to its customers. Our strong R&D expertise coupled with our global system integration services and decades of experience in fibre optics enable us to deliver innovative digital network solutions required for the most advanced networks.

The Company's in-house R&D Centers located at Gurgaon & Bengaluru along with invested R&D Houses and other R&D collaborators at different locations in India and abroad, innovate a futuristic range of technology products and solutions. HFCL has developed capabilities to provide premium quality Optical Fiber and Optical Fiber Cables, state-of-the-art telecom products including 5G Radio Access Network (RAN) products, 5G Transport Products, WiFi Systems (WiFi 6, WiFi 7), Unlicensed Band Radios, Switches, Routers and Software Defined Radios.

The Company has state-of-the-art Optical Fiber and Optical Fiber Cable manufacturing plants at Hyderabad, Optical Fiber Cable manufacturing plant in Goa and in its subsidiary HTL Limited at Chennai.

We are a partner of choice for our customers across India, Europe, Asia Pacific, Middle East, Africa, and USA. Our commitment to quality and environmental sustainability inspires us to innovate solutions for the ever-evolving customer needs.

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# **Revision History**

Date	Rev No.	Description	Owner
28/02/2023	A0-00	Initial Draft Release	HFCL
12/05/2023	A0-01	Revised Draft	HFCL
30/5/2023	A0-02	Updated Draft	HFCL