

# COMMANDO AIR-AP1200-PRO Indoor Access Points Configuration Guide

#### **Configuration Guide**

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# **Overview**

COMMANDO AIR-AP1200-PRO is Indoor AP which enables communication between wireless and wired computers/laptops and mobile devices in the network. It complies IEEE 802.11ac/b/g/n standard and comes with dual band 2.4GHz+5GHz with separate 10/100/1000Mbps WAN and LAN ports with dual power input facility with either IEEE 802.3at PoE+ input or DC IN 12V, 1.5A. COMMANDO AIR-AP1200-PRO is a dual Radio, 2×2 MU-MIMO Omni Ant, Cloud Access Point Indoor Access Point that works in standalone AP in FAT mode and as R-100 Controller based mode of operation in FIT mode. Default operation mode is FIT mode which enables communication between wireless users with speed up to 1200Mbps with beamforming Wi-Fi technology. It is standalone as well as controller-based device, comes with dual band with 2.4GHz(300Mbps) & 5GHz(900Mbps), equipped with separate 1G WAN port & 1G LAN port. It can provide powerful wireless coverage to enterprise environments such as small, medium enterprises, university campus, concert venue, gymnasium, etc.

It is industrial grade Wall/Ceiling can install at every place to work as an stable base station for access users. It supports (IEEE 802.3at) PoE+, which helps in easy installation by eliminating the need of a dedicated power source and need of a power adapter. It can identify and determine the correct transmission speed and half/full duplex mode of the attached devices. It also supports standard Auto-MDI/MDI-X that can detect the type of connection to any Ethernet device without requiring special straight or crossover cables, Store-and-Forward forwarding scheme to ensure low latency and high data integrity. FAT mode support multiple operational modes like AP, routing mode (Default mode is FIT-AP mode). Multi SSID up to 8 with inbuilt Wi-Fi channel analysis. Management with the help of WEB GUI, R-100 WLAN Controller & from Cloud portal. Support Open or encryption like WPA-PSK, WPA2-PSK and WPA-PSK+WPA2-PSK with the function of the built in MAC filter using white and blacklisting users.

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Fig 1. Physical port on AIR-AP1200-PRO

Table 1. Physical port on AIR-AP1200-PRO Description.

Physical Port	Description
Reset	Reset Button, makes AP revert to default settings after pressing for 15sec.
WAN/PoE	WAN Port, connect with PoE+ Switch or internet gateway.
LAN	LAN Port to end users Switch or PC for Accessing device via Web-GUI.
DC	DC input power 12V, 1.5 A.



Fig 2. AIR-AP1200-PRO Description

Important Note: Access IP for AIR-AP1200-PRO is 192.168.188.251 and default password is admin.

It supports three operational modes FIT, FAT & FAT Routing operation mode. In FIT mode, AP works with the R-100 controller and all configuration is centrally managed by controller. In FAT mode, AP can use WEBGUI and configure standalone AP. In FAT routing mode can also work as gateway alone with standalone AP operation (Default mode is FIT-AP mode). It supports up to 130+ wireless users/clients & supports distance of 35 meters and above from AP in all directions for wireless clients. It is industrial grade Wall/Ceiling Indoor Access Point with speed up to 1200Mbps. It equipped with separate Gigabit WAN & LAN port which enhances the sharing of files, photo, audio, video and gaming experience over wireless network. It can also be used as DHCP server and works as layer 3 device when configured in FAT-Routing mode. It supports (IEEE 802.3at) PoE+, which helps in easy installation by eliminating the need of a dedicated power source and need of a power adapter. It can identify and determine the correct transmission speed and half/full duplex mode of the attached devices. It also supports standard Auto-MDI/MDI-X that can detect the type of connection to any Ethernet device without requiring special straight or crossover cables, Store-and-Forward forwarding scheme to ensure low latency and high data integrity.

You can access and manage AIR-AP1200-PRO using the Web based GUI (Graphical User Interface), also called Web-GUI.

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# Introduction

COMMANDO AIR-AP1200-PRO Indoor AP are WEB GUI based easy to use and manage device with controller as well as standalone. It requires minimal configuration, so setup is simple and hassle-free. This configuration guide mainly intended for standalone AP configuration settings. Auto-negotiation senses the link speed of a network device in wired 10/100/1000Mbps and also for wireless clients. It intelligently adjusts for compatibility and optimal performance by DFS and setting channel bandwidth 20/40MHz in 2G band and 20/40/80MHz in 5G wireless band and also can check free channels available with inbuilt Wi-Fi analysis. Its compact size makes it ideal for Indoor desktops/wall/ceiling with limited space. Dynamic LED lights provide real-time work status display and basic fault diagnosis. Easy Plug-and-play installation with no configuration required. It operates quietly, making it ideal for use in virtually any room or office. Perfect for noise sensitive environments. It has Dual power options with DC input power and PoE power input which protect from power failures and increases life of device. With Inbuilt security feature of Black and whitelist protect your business by losing network sensitive information and data of wireless users/surveillance cameras connected to them.

It supports energy-efficient Ethernet that can save power. It automatically adjusts power consumption according to the link status to limit the carbon footprint of your network. It also complies with RoHS, CE, FC prohibiting the use of certain hazardous materials. Besides that most of the packaging material can be recycled and reused.

It has State of art quality product that can serve on real time high-speed Performance with dual input power, cost effective, highly reliable, conformance to international open standards, durable, serviceable, aesthetics, perceived quality, enhanced performance leads to value to money.

# Hardware Highlights

## Solid performance with non-blocking architecture

- Up to 16 MB Flash, 128MB RAM
- LAN and WAN ports capable of Gigabit Ethernet speed with (Auto-Negotiation/Auto MDI/MDIX).
- Solid performance with non-blocking architecture.

## Physical Ports and Networking Interfaces

- Up to 2 x 10/100/1000 Mbps Rj45 Ethernet Ports with combined IEEE 802.3at PoE+ with WAN and separate LAN port
- LED Indicators: Power, LAN/WAN (Link/Act)

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Reset Button

#### Extra Long operational life

- Dual input Power Either DC 12V/1.5A or IEEE 802.3at PoE+ via WAN port.
- High Quality PCB Circuit Board and PCB Surface Treatment Using Gold Sinking Process.
- Support temperature range 0° C to 50° C
- Desktop and Wall mount design that enables to mounts Which enables horizontal and vertical wall mounting.
- Comes with one-year default warranty optionally extendable up to 3 years.

## Noise-free Operation

• The ports support reduced power modes for silent operation. Perfect for noise sensitive environments.

# Software Highlights

COMMANDO AIR-AP1200-PRO supports Standalone software functions as follows.

# **FIT Mode Software Features**

It's software support SSID broadcasting, Multi SSID up to 8 (4 SSID in 2.4GHz, 4 SSID in 5GHz) and has routing mode with static IP, dynamic IP, Wireless AP mode in FAT AP. It also as built-in firewall with MAC backlist and whitelist. FAT mode software features are as follows:

## System overview

Rate status, User, Device, Hardware, RF and User information.

## Ports settings

Access method like static or DHCP, IP address alone with default gateway & DNS.

# WI-FI settings

It can set SSID and RF Setting as per user requirement.

# SSID Settings

SSID settings can set 2.4G & 5G SSID name, Security type, VLAN, rate limit, Hide SSID and Guest mode.

## **RF** Settings

Set Channel in auto or desired number in 2G & 5G band along with User Count Limit. You also can limit Min Access Signal, Transmit Power, Channel Width.

## User control

Currently AP associated Wireless client list is shown here.

## User list

Live Wireless client list is shown.

# Black and whitelist

These lists is used to block or allow specific wireless client to access your network based on a list of blocked devices (Blacklist) or a list of allowed devices (Whitelist).

## System settings

It shows Basic, Timing setting along with Login Management, Device reboot and Restore.

# FIT Mode Software Features

Controller like R-100, which can provide cloud-based access and software functions as follows.

# Monitoring

Interface, Terminal, Protocol, Policy, System, Flow Control.

# System Setup

Basic Setting, Disk management, Cloud Account, Advanced Settings like ALG Set, Administration, Upgrading, Reboot.

## Network

Interfaces, DHCP, DNS, IP/MAC Group, Static Routes, VLAN, VPN Client, UPNP NAT, Port Mapping, IPv6, IGMP Agent.

# Flow Control

Multi-WAN features Load Balancing/Protocol/Port Forward/Domain Name/Upload/Download, Smart Flow Control, IP/MAC Limiters, Protocol Library.

## Access Controller

Wireless overview, AP Configuration, AP group, AP Firmware Upgrades, Wireless black and whitelist, User Information.

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**1. Wireless overview:** Open Access Controller with ON/OFF button. The connected AP will automatically enter the AP device list and can Manage AP. Running State of AP status with Online AP, Offline AP, fast roaming, 5G first along with terminal statistics like 2.4G online, 5G online, peak online, active terminal, inactive terminal. Wireless Network Rating with traffic statistics, terminal association details with Access evaluation, Access times, Average access success rate with Network transmission quality.

**2. AP Configuration:** Access Point Configuration with All groupings, All Status like Online/Offline/Upgrading, All Frequency like (2.4G/2.4G+5G) and IP/MAC/Model/Remarks.

Interference Analysis with Start Searching AP, MAC, Remarks, BSSID, BSSID Remark, SSID, Signal Value, Channel along with Import or Export configuration files.

Default Configuration for 2.4G, 5G Radio with other Setting like SSID1 Name - COMMANDO01

SSID1 Security No Password, SSID1 VLAN Close, Hide SSID1 Name Open, SSID rate limit Open, Guest Mode Open (Isolate guest devices discovery and access to wired network) Channel Auto, AP Signal 80% default Channel width 20 MHz can change to 40MHz or self-adaptation, Airtime scheduling, Advanced settings like Beacon frame power

Follow AP signal strength Beacon frame interval 200ms, RTS threshold0, Low-rate access license Allow all, Management frame rate 1Mbps.

**3.** AP group: AP Group Add/Delete with Group name, Number of AP, channel, Maximum belt capacity, SSID, Actions. With Add button click we can set Group name with 2.4G/5G control state information.

**4. AP Firmware Upgrades:** Access Point Upgrades with MAC/Model, Upgrade All, Batch Upgrade with information like MAC Address, Current Version, Latest Version, Status, AP Remarks, Actions

5. Wireless black and whitelist: These lists is used to block or allow specific wireless client to access your network based on a list of blocked devices (Blacklist) or a list of allowed devices (Whitelist).

**6. User Information:** User Information with IP/MAC/SSID, All Frequency (2.4G/5G), All users along with weak signal users and normal users showing information like IP Address, MAC, AP Information, SSID, Signal, Connect Time, Tx, Rx, Comment, Actions.

## Authentication

Captive Portal, VPN Server, Authentication Account, Push Notification.

## Behavior

Behavior Audit with Mark MAC Address, MAC Control, Website Control, URL Control, Application Protocol Control, Secondary Routing, QQ, Blacklist/Whitelist.

# Firewall

ACL Rules, ARP binding, Connection Limiter, Advanced Firewall. Advanced application-->Dynamic DNS, SNMP, Application across three layers, Wake on LAN, FTP Server, HTTP Server, UDPXY Set.

# Services

Ping Test, Capture Packet, Trace Route, IP Sub-netting, Speed Test, Diagnostics, Watchdog.

# Log

User Logs, Function Logs, System Logs.

COMMANDO AirPRO Ceiling AP's controller also has cloud captive portal with AirPRO Cloud Login <u>http://commandonetworks.com.cn/#/login</u>.

# How to take access of COMMANDO AIR-AP1200-PRO?

1) Wired access Via LAN port connected to PC.

Power ON AIR-AP1200-PRO either by PoE+ switch or 12V, 1.5A adapter.

Connect LAN port of AIR-AP1200-PRO to PC via RJ-45 cable.

Open Network and sharing center.

Go to Change adapter settings.

Double click on Local Area Connection. Go to Properties. Double click on Internet Protocol Version 4 (TCP/IPv4) option and set any IP address form 192.168.188.1 to 250 and Gateway of PC to be set as 192.168.188.251 to as shown below.

Internet Protocol Version 4 (TCP/IPv4) Properties					
General					
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.					
Obtain an IP address automatical	у				
• Use the following IP address:					
IP address:	192 . 168 . 188 . 10				
Subnet mask:	255 . 255 . 255 . 0				
Default gateway:	192 . 168 . 188 . 251				
Obtain DNS server address automatically					
Use the following DNS server addr	resses:				
Preferred DNS server:					
Alternate DNS server:					
Validate settings upon exit	Advanced				
	OK Cancel	I			

Fig 3. IP setting in PC connected to AIR-AP1200-PRO

## 2) Wireless access Via SSID connected to PC.

Power ON AIR-AP1200-PRO.

Connect Default SSID named "COMMANDO 2.4G" or "COMMANDO 5G" with no default Wi-Fi Password required. It is open to all by default.

Click on properties of connected SSID "COMMANDO 2.4G" or "COMMANDO 5G". Edit IP setting from DHCP to Manual and set any IP address form 192.168.188.1 to 252 and Gateway of PC to be set as 192.168.188.251 to as shown below.

Note: All Default SSID and password can be changed as per user requirement.

COMMANDO 2.4G							
COMMANDO 5G							
Network & Internet settings Change settings, such as making a connection metered.							
ſī.	цр.	((j)) Mahila					
Wi-Fi	Airplane mode	hotspot					
Fig 4. Default Open SSID of AIR-AP1200-PRO							
COMMANDO 2.4G							

116	No Internet, open	
	Properties	
		Disconnect

Fig 5. Properties of SSID COMMANDO 2.4G

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← Settings	Edit IP settings	
ŵ POCO PHO	Manual	~
If you have a limited data p make this connection a me differently to reduce data u	IPv4	
Set as metered connection	IP address 192.168.188.20	
If you set a data limit, Winc for you to help you stay un	Subnet prefix length	
Set a data limit to help con	24	
IP settings	Gateway 192,168,188,251	×
IP assignment:	Proferred DNS	
Edit		
Properties	Alternate DNS	
SSID:	Save	Cancel
Protocol:		

Fig 6. Edit IP setting from DHCP to Manual as shown for COMMANDO 2.4G

Open any web browser like Chrome/Firefox/Internet Explorer/Opera etc and enter default IP address **192.168.188.251** in address field.

**Caution:** If you have already taken any Other COMMANDO wireless device access. Then before taking access of this device, you are required to clean the browser history to avoid catch pages issue.



Fig 7. Login page for AIR-AP1200-PRO Page

Default Password: admin

Note: Password can be changed as per user choice.

After giving proper password Home page is displayed giving device information like CPU usage, memory usage, LAN Information, Status with 2G/5G Wi-Fi Clients, Rate status, User, Device, Hardware, RF and User information.

AIR-AP1200-PI 1.7.4 Build2022	O 06271431				<u>ጉ</u> ጉ	ዶ	English
⇒	System overview > System overview						
<u></u>	System overview						
(-) System overview	COMMANDO Rate status		User information				
Ports settings	connected Extranet		1	1	0		
🄶 WIFI settings 🗸	Already running: 5 m 55 s	;	Online user	Normal user	Weak signal user		
$\Box$ User control $\lor$							
∰ System settings∨	Device Information		hardware information				
	Equipment name: COMMANDO Device model: AIR-AP1200-PRO IP address: 192.168.188.251 MAC: 8C:02:FA-60:03:28						
			19 % CPU usage		42.95 % Memory usage		
	Firmware version: 1.7.4						
	RF information 24G 5						5G
	channel: 6 (auto) bandwidth: 20 MHz	Channel utilization: 29% C	hannel noise floor: -101 dbm	öignal strength: 100%			
	Interface information						
	wan lan						

Fig 8. Home page after login AIR-AP1200-PRO Page

# **1.System overview**

After login, System overview page will be showed. This page will show Information like WAN connection status, number of user connected, Device name, IP address to access, firmware, hardware like CPU and memory status, RF channel and bandwidth in 2G/5G Wi-Fi along with interface information can help to troubleshoot network issue, if any very easily.

AIR-AP1200-PI 1.7.4 Build2022	RO 205271431	습 🖱 A English
⇒	System overview > System overview	
System overview	System overview	
. Ports settinos	COMMANDO Rate status User information	
Soo WEI settings	connected Extranet $\sqrt[1]{4.0}_{B/s}$ 1 1	0
·	Already running: 5 m 55 s I 2 7 3 B/s Online user Normal user	Weak signal user
See Control V		
ç⊖r System settings∧	Device Information hardware information	
Dasic settings		
liming setting	tquipment name: COMMANDO Device model: AIK-AP1200-PRO	44.41 m
Login Management	IP address: 192.168.188.251 MAC: 8C:02:FA:60:03:28 CPU usage	Memory usage
Device reboot	Firmware version: 17.4	
Restore		
	RF information	2.4G 5G
	channel: 1 (auto) bandwidth: 20 MHz Channel utilization: 12% Channel noise floor: -102 dbm Signal strength: 100%	
	Interface information	
	van lan	

Fig 1.1 Home page Components of AIR-AP1200-PRO Page

# Configuration with icons

On right corner there are easy to configure icons which allows to upgrade, device reboot, Reset to factory default, passwords and sign out along with Language setting for display pages.

AIR-AP1200-P 1.7.4 Build202	RO 206271431				<u> </u> ①    ①	ዶ	English
⇒	System overview > System overview						
- System overview	System overview						
Ports settings	COMMANDO	Rate status	User information				
🎅 WIFI settings 🕠	connected Extranet	↓ 74.0 <sub>B/s</sub>	0	0	0		
	Already running: 5 m 49 s	↑74.0 <sub>B/s</sub>	Online user	Normal user	Weak signal u	iser	
🖵 User control 🗸	Device Information		hardware information				
۞ System settings~	Equipment name: COMMANDO IP address: 192.168.188.251 Firmware version: 1.7.4	Device model: AIR-AP1200-PRO MAC: 8C:02:FA:60:03:28		% age	43.87 Memory us	% age	
	RF Information channel: 1 (auto) bandwidth: 20	MHz Channel utilization: 38%	Channel noise floor: -103 dbm	Signal strength: 100%		2.4G	5G

Fig 1.2 Configuration with icons in AIR-AP1200-PRO Page

## Version Upgrade:

Displays the current configuration version of the AP and allows Automatic Updates.

AIR-AP1200-P 1.7.4 Build202	RO 206271431			습 아 유 English
$\Rightarrow$	System overview > System overview			Ungrade
	System overview			opgrade
규 Ports settings	COMMANDO CONNECTED Extranet Already running: 6 m 39 s	Rate status ↓ 74.0 B/s ↑ 74.0 B/s	User information O Online user Normal us	0 ier Weak signal user
및 User control ∨	Device Information Equipment name: COMMANDO IP address: 192.168.188.251 Firmware version: 1.7.4	Device model: AIR-AP1200-PRO MAC: 8C:02:FA:60:03:28	hardware information	43.90 % Memory usage

Fig 1.3 Upgrade icons in AIR-AP1200-PRO Page

Upgrade Version: Displays the current Configuration version is latest or not and Auto Upgrade option you can upgrade firmware to get more functions and better performance.

Note:

- 1) After upgrading, the device will reboot automatically.
- 2) To avoid damage to device, please don't turn off the device while upgrading.
- 3) It is advised to backup the configuration before upgrading.

For Version upgrade click on upgrade icons.

AIR-AP1200-F 1.7.4 Build202	PRO 1206271431			수 🖰 Զ English
=>	System overview > System overview			
— System overview	System overview		/	-
品 Ports settings	COMMANDO	Rate status	User information	
🙃 WIFI settings \land	Connected Extranet Already running: 7 m 9 s	↓ 546 b/s ↑ 128 b/s	0 0 Online user Normal user	<b>O</b> Weak signal user
RF settings		Prompt	×	
☐ User control ∨ ∯ System settings∨	Device Information	Already the latest version	ation	
	Equipment name: COMMANDO	Device model: AIR-AP1200-PRO		
	IP address: 192.168.188.251	MAC: 8C:02:FA:60:03:28	100 % CPU usage	43.90 % Memory usage
	Firmware version: 1.7.4			

Fig 1.4 Version Checking in AIR-AP1200-PRO Page

# Reboot / Reset to factory default lcon:

The configuration will not be lost after rebooting. The Internet connection will be temporarily interrupted while rebooting.

For Reboot, Click on Device reboot

AIR-AP1200-P 1.7.4 Build202	RO 206271431			습 () 은 Englis	sh
$\Rightarrow$	System overview > System overview			Device reboot	
	System overview			Restore Factory	
System overview					
品 Ports settings	COMMANDO	Rate status	User information		
🔶 WIFI settings 🗠	connected Extranet	↓ 74.0 <sub>B/s</sub>	0	0 0	
SSID settings	Already running: 9 m 59 s	↑74.0 <sub>B/s</sub>	Online user	Vormal user Weak signal user	
RF settings					
및 User control ∨	Device Information		hardware information		
र्ट्}े System settings∨					
	Equipment name: COMMANDO	Device model: AIR-AP1200-PRO			
	IP address: 192.168.188.251	MAC: 8C:02:FA:60:03:28	0 % CPU usage	43.92 % Memory usage	
	Firmware version: 1.7.4				

Fig 1.5 Device reboot and Restore factory option in AIR-AP1200-PRO Page

AIR-AP1200-P 1.7.4 Build202	RO 206271431				습 🖒 ዶ English
$\equiv$	System overview > System overview				
- System overview	System overview				
品 Ports settings	COMMANDO	Rate status ↓ 74.0 B/s	User information	0	0
SSID settings RF settings	Already running: 10 m 29 s	↑ 487 p/c Prompt	×	<b>V</b> Normal user	U Weak signal user
및 User control ~ ô System settings~	Device Information	The network will be interrupte you want to continue?	d during reboot. Do	tion	
	Equipment name: COMMANDO	h	Cancel Contirm		13.82 %
	IP address: 192.168.188.251 Firmware version: 1.7.4	MAC: 8C:02:FA:60:03:28	CPU	Jusage	Memory usage

Fig 1.6 Reboot option in AIR-AP1200-PRO Page

# **Restore Factory**

Restore factory configuration feature allow end users to reset the AP to factory default settings, You can restore the AP to its factory default settings by the Reset button or by factory reset option in this page. It must be noted that once the AP is reset, all the current configuration settings will be lost.



Fig 1.7 Reset option in AIR-AP1200-PRO Page

#### Password Setting:

On this page, you can modify the factory default username of the AP and create multiple new password

#### Note:

The factory default password is admin.

You can modify default password. The Password length minimum 8 and maximum 64 characters, and can contain letters, numbers, special symbols as per user. All the fields are case-sensitive.

AIR-AP1200-P 1.7.4 Build202	RO 206271431			合 🖒 🙇 English
=>	System overview > System overview			password setting
— System overview	System overview			sign out
Ports settings	COMMANDO	Rate status	User information	
? WIFI settings ^	connected Extranet	↓ 74.0 <sub>B/s</sub>	0 0	0
SSID settings	Already running: 11 m 39 s	1 /4.0 B/s	Online user Normal user	Weak signal user
RF settings				
☐ User control ∨	Device Information		hardware information	
ố; System settings~				
	Equipment name: COMMANDO	Device model: AIR-AP1200-PRO		
	IP address: 192.168.188.251	MAC: 8C:02:FA:60:03:28	10 % CPU usage	43.84 % Memory usage
	Firmware version: 1.7.4			

Fig 1.8 Password Setting option in AIR-AP1200-PRO Page

AIR-AP1200-PI 1.7.4 Build2022	RO 206271431		企	ப	ዶ	English
=>	System settings > Login Management					
	Login Management					
品 Ports settings	Login Settings					
🔶 WIFI settings 🗸	* Old Password	••••••				
🖵 User control 🗸						
ද්ටූදි System settings^	* New Password					
Basic settings						
Timing setting	* Confirm Password					
Login Management		Save				
Device reboot						
Restore						

Fig 1.9 Login Setting option in AIR-AP1200-PRO Page

AIR-AF 1.7.4 B	200-PRO ild202206271431		企	Ċ	ዶ	English
=>	System settings > Login Management					
System overv	Login Management					
品 Ports settings	Login Settings					
🙃 WIFI settings	* Old Password	••••••				
GUser control	~					
② System settin	* New Password	commando 🛞 🕲				
Basic settings	* Confirm Descurar	commanda 🖉 🖉				
Timing setting	- Commit Password	commando				
Login Manag	nent	Save Cancel				
Device reboo						
Restore						

Fig 1.10 Login Setting as per user in AIR-AP1200-PRO Page



Fig 1.11 Login Setting as per new password in AIR-AP1200-PRO Page

## Sign Out:

Sign out means to end access of device. Sign out informs the device that the current user wishes to end the login session. After Clicking Sign Out, it will be directed to Login page.

AIR-AP1200-P 1.7.4 Build202	RO 206271431			☆ 些 A English
=>	System overview > System overview			password setting
— System overview	System overview			sign out
Ports settings	COMMANDO	Rate status	User information	
🔶 WIFI settings 🗸	connected Extranet	↓ 74.0 в/s	0 0	0
🖵 User control 🗸	Already running: 5 m 42 s	↑74.0 <sub>B/s</sub>	Online user Normal user	Weak signal user
දÔj} System settings∨				
	Device Information		hardware information	
	Equipment name: COMMANDO	Device model: AIR-AP1200-PRO		
	IP address: 192.168.188.251	MAC: 8C:02:FA:60:03:28	10 % CPU usage	44.01 % Memory usage
	Firmware version: 1.7.4			

Fig 1.12 Sign Out Setting in AIR-AP1200-PRO Page



Fig 1.13 After Sign out AIR-AP1200-PRO Page

Language Options:

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Helps to select language as per choice of user.

AIR-AP1200-P 1.7.4 Build202	RO 206271431			<u>ት</u> ይ	English
$\Rightarrow$	System overview > System overview				简体中文
— 🕤 System overview	System overview				繁体中文 English
品 Ports settings	COMMANDO	Rate status	User information		
🔶 WIFI settings 🗸	connected Extranet	↓ 74.0 <sub>B/s</sub>	0 0	0	
🐷 User control 🗸	Already running: 6 m 46 s	↑74.0 <sub>B/s</sub>	Online user Normal user	Weak signal user	
ද⊖} System settings∨					
	Device Information		hardware information		
	Equipment name: COMMANDO	Device model: AIR-AP1200-PRO			
	IP address: 192.168.188.251	MAC: 8C:02:FA:60:03:28	10 % CPU usage	44.01 % Memory usage	
	Firmware version: 1.7.4				

Fig 1.14 Language Option in AIR-AP1200-PRO Page Note: Default language setting is English.

## 1.1 WAN Information

In WAN Information of AP, Status of WAN connection along with device name, uptime and the Rate status in bits/second is displayed of the AP is shown.



Fig 1.1.1 WAN Status of AIR-AP1200-PRO

#### 1.2 User Information

You can view User Information like how many wireless clients and their categories like Online user with Normal range or weak signal users which are connected to AP.



Fig 1.1.2 Device Description of AIR-AP1200-PRO

#### 1.3 Device Information:

Device information show Equipment name default Equipment name is COMMANDO, Device model name AIR-AP1200-PRO, current IP address by default 192.168.188.251 can change as per user requirement and also device MAC address along with software current firmware version.

Device Information	
Equipment name: COMMANDO	Device model: AIR-AP1200-PRO
IP address: 192.168.188.251	MAC: 8C:02:FA:60:03:28
Firmware version: 1.7.4	

Fig 1.1.3 Device Information of AIR-AP1200-PRO

#### 1.4 Hardware information:

Hardware information shows CPU and Memory usage percentage.

hardware information



Fig 1.1.4 Hardware information of AIR-AP1200-PRO

#### 1.5 RF information

In RF Information shows 2.4G and 5G channel used either manual or auto along with channel bandwidth used 20/40/80 MHz with Channel utilization rate, Channel noise floor in dbm with Signal strength.

RF information channel: 1 (auto)	bandwidth: 20 MHz	Channel utilization: 19%	Channel noise floor: -99 dbm Signal strength: 100%	2.4G 5G
Fig 1.5.1 RF inf	ormation for 2.4	G of AIR-AP1200	)-PRO	
RF information				2.4G 5G
channel: 40 (auto)	bandwidth: 80 MHz	Channel utilization: 6%	Channel noise floor: -104 dbm Signal strength: 100%	

Fig 1.5.2 RF information for 5G of AIR-AP1200-PRO

#### 1.6 Interface Information

Displays the current enabled WAN/LAN port(s). All Interface Status automatically refresh in 5 sec intervals. Green means active and red means inactive.



Fig 1.6.1 Interface Status of AIR-AP1200-PRO

AIR-AP1200-P 1.7.4 Build202	NO 206271431		습 🖒 Զ English
$\Rightarrow$	System overview > System overview		
_	System overview		
(~) System overview	Device Information	hardware information	
🛱 Ports settings			
🙃 WIFI settings 🗸	Equipment name: COMMANDO Device model: AIR-AP1200-PRO	10	11.50
및 User control ∨	IP address: 192.168.188.251 MAC: 8C:02:FA:60:03:28	TO % CPU usage	44.59 % Memory usage
② System settings^	Firmware version: 1.7.4		
Basic settings			
Timing setting			
Login Management	RF information		2.4G 5G
Device reboot	channel: 11 (auto) bandwidth: 20 MHz Channel utilization: 21% Ch	annel noise floor: -102 dbm Signal strength: 100%	
Restore	Port rate: 1000 Mbps wan lan		

Fig 1.6.2 Physical connection of AIR-AP1200-PRO

## Important Note:

1. In FIT mode, we can set basic setting and can not set port, Wi-Fi, User and System Setting.

2. In FAT mode, we can set all including port, Wi-Fi, User and System Setting.

# 2. Ports settings

In port setting we can set Access method like DHCP or Manual static IP address along with subnet mask and default gateway. We can also set DNS manually with Preferred DNS and Alternative DNS.

For Changing port setting click on Ports setting

AIR-AP1200- 1.7.4 Build20	RO 206271431			企	Ċ	ዶ	English
=,	Ports settings > Ports settings						
	Ports settings						
(-) System overview	Ports settings						
品 Ports settings							
🄶 WIFI settings 🗸		Access method	DHCP				
🖵 User control 🗸			DHCP				
දිට්රි System settings^		* IP address	Static IP				
Basic settings		Subnet mask	请选择 ~				
Timing setting							
Login Management		* Default gateway					
Device reboot							
Restore		DNS	DHCP acquisition     Manually specify				
		* Preferred DNS					
		Alternative DNS					
			Save Cancel				

Fig 2.1 Port Setting of AIR-AP1200-PRO

AIR-AP1200-F 1.7.4 Build202	RO 206271431		ļ
⇒	Ports settings > Ports settings		
	Ports settings		
Ports settings	Access method	DHCP	
WIFI settings ~ SSID settings	* IP address		
RF settings	Subnet mask		
User control V	+ Default estaum		
	" Delaur Gateway		
	DNS	DHCP acquisition     Manually specify	
	* Preferred DNS		
	Alternative DNS		
		Save Cancel	

Fig 2.2 Default Port Setting DHCP of AIR-AP1200-PRO

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AIR-AP1200-P 1.7.4 Build202	NO 106271431	습 😃 Զ English
=>	Ports settings > Ports settings	
- System overview	Ports settings	
Ports settings	Ports settings	
🎅 WIFI settings 🗸	Access method DHCP	~
User control V	* IP address 192.168.188.	251
ଟ୍ପୁତ୍ର System settings∨	ii duureda i too too.	
	Subnet mask 255.255.255.	Q (24) Y
	* Default gateway	
	DNS O DHCP acqu	isition O Manually specify
	* Preferred DNS 8.8.8.8	
	Alternative DNS 8.8.8.8	
	Save	ancel

Fig 2.3 Port Setting DHCP of AIR-AP1200-PRO

AIR-AP1200-F 1.7.4 Build202	NO 206271431		仑	ப	ዶ	English
=>	Ports settings > Ports settings					
- System overview	Ports settings					
Ports settings	Ports settings					
🎅 WIFI settings 🗸	Access method	Static IP 🗸				
$\Box$ User control $\lor$						
ද⊖ුී} System settings∨	* IP address	192.168.1.150				
	Subnet mask	255.255.255.0 (24) $\lor$				
	* Default gateway	192.168.1.1				
	* Preferred DNS	8.8.8.8				
	Alternative DNS	8.8.4.4				
		Save				

Fig 2.4 Port Setting DNS of AIR-AP1200-PRO

# 3. Wi-Fi Settings

In Wi-Fi setting you can set the 2.4G/5G Wi-Fi SSID and RF setting and Advanced settings.

# 3.1 SSID Settings

We can set 2.4G/5G Wi-Fi with Basic Setting along with SSID setting. You can enable or disable Wi-Fi by

Wi-Fi Operating Status (Disable): On mean SSID is available for wireless clients. Wi-Fi Operating Status (Enable): Off mean SSID not available.

Note: 1. By default Basic Wi-Fi SSID "COMMANDO 2.4G" and "COMMANDO 5G" is turned ON. 2. By default no Password/authentication is required to connect to SSID.

AIR-AP1200-P 1.7.4 Build202	RO 206271431				企	아 <mark>온 Englis</mark> h
⇒	WIFI settings > SSID settings					
	SSID settings					
(+) System overview	2.4G SSID					
Ports settings		Security tree	CCID V/LAN	Hide CCID	Guest made <b>A</b>	operating
🎅 WIFI settings 🤸	3310 hame	security type	SSID VEAN	The SSID	Guest mode	operating
SSID settings	COMMANDO 2.4G	Open	Close	Close	Close	edit Disabled
RF settings		Open	Close	Close	Close	edit Enable
및 User control ∨		Onen	Close	Close	Close	edit Enable
ô System settings~		open	0.000	0.000	0.032	
		Open	Close	Close	Close	edit Enable
	5G SSID					
	SSID name	Security type	SSID VLAN	Hide SSID	Guest mode 📀	operating
	COMMANDO 5G	Open	Close	Close	Close	edit Disabled
		Open	Close	Close	Close	edit Enable
		Open	Close	Close	Close	edit Enable
		Open	Close	Close	Close	edit Enable

For Changing SSID parameters Click on Wi-Fi Setting> SSID Setting



AIR-AP1200-P 1.7.4 Build202	PRO 2206271431				仓	아 온 English
=>	WIFI settings > SSID settings					
_	SSID settings					
(~) System overview	2.4G SSID					
品 Ports settings						
🔶 WIFI settings \land	SSID name	Security type	SSID VLAN	Hide SSID	Guest mode 📀	operating
SSID settings	COMMANDO 2.4G	Open	Close	Close	Close	edit Disabled
RF settings		Open	Close	Close	Close	edit Enable
User control  V		Open	Close	Close	Close	edit Enable
- Cha - System Socialitys		Open	Close	Close	Close	edit Enable

Fig 3.1.2 Default 2.4G Wi-Fi enable of AIR-AP1200-PRO

## How to change SSID (Wi-Fi Name)?

For changing SSID name and parameters, Click on WI-FI Setting>>SSID Setting>>Edit. In SSID Setting, various parameters like SSID name, Security type either Open, WPA-PSK, WPA2-PSK or WPA-PSK+WPA2-PSK can be set. You can also set SSID VLAN and can also rate limit of Uplink speed limit and Downstream speed limit in KB/s. You can Hide SSID or configure Guest mode which Prohibit mutual visits and access to wired.

SSID settings			×
SSID name	COMMANDO 2.4G		
Security type	Open ~		
SSID VLAN	Open		
SSID rate limit	Open		
Hide SSID	Open		
Guest mode	Open ( Prohibit mutual visits and access to w	vired )	
		Cancel	Confirm
Fig 3.1.3 SSID Setting	g of AIR-AP1200-PRO		

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## SSID settings

SSID name	COMMANDO 2.4G	
Security type	WPA-PSK+WPA2-PSK ~	
SSID password	••••••	
SSID VLAN	Open	
	2	
SSID rate limit	Open	
Hide SSID	Open	
Guest mode	Open ( Prohibit mutual visits and access to w	ired )

Cancel

Fig 3.1.4 Setting security for AIR-AP1200-PRO

AIR-AP1200-Pi 1.7.4 Build2022	RO 206271431				<b>企</b> (	) A English
$\Rightarrow$	WIFI settings > SSID settings					
- System overview	SSID settings					
品 Ports settings	2.4G SSID					
🙃 WIFI settings \land	SSID name	Security type	SSID VLAN	Hide SSID	Guest mode 📀	operating
SSID settings	COMMANDO 2.4G	WPA-PSK+WPA2-PSK	2	Close	Close	edit Disabled
RF settings		Open	Close	Close	Close	edit Enable
및 User control ~		Open	Close	Close	Close	edit Enable
egg - System settings -		Open	Close	Close	Close	edit Enable

Fig 3.1.5 COMMANDO 2.4G Wi-Fi with security setting WPA-PSK+WPA2-PSK AIR-AP1200-PRO

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Fig 3.1.6 COMMANDO 2.4G access with security setting to Wireless clients of AIR-AP1200-PRO

AIR-AP1200-P 1.7.4 Build202	RO 206271431				企	아 온 English
=>	WIFI settings > SSID settings					
Surtem overview	SSID settings					
品 Ports settings	2.4G SSID					
🔶 WIFI settings \land	SSID name	Security type	SSID VLAN	Hide SSID	Guest mode 🤉	operating
SSID settings	COMMANDO 2.4G	WPA-PSK+WPA2-PSK	2	Close	Close	edit Disabled
RF settings		Open	Close	Close	Close	edit Enable
🖵 User control 🗸						
\$\$\$ System settings∽		Open	Close	Close	Close	edit Enable
		Open	Close	Close	Close	edit Enable

Fig 3.1.7 Enabling 2.4G VAP of AIR-AP1200-PRO

## SSID settings

SSID name	Network1		
Security type	WPA-PSK+WPA2-PSK		
SSID password	••••••		
SSID VLAN	Open		
SSID rate limit	Open		
Hide SSID	Open		
Guest mode	Open ( Prohibit mutual visits and access to w	ired )	
		Cancel	Confirm

Fig 3.1.8 Setting 2.4G VAP 1 SSID and parameters of AIR-AP1200-PRO

**Important Note:** You can create SSID Wi-Fi password as per your choice but wireless clients can connect only after enabling SSID.

AIR-AP1200-P 1.7.4 Build202	RO 206271431				仓	ው ዶ	English
=,	WIFI settings > SSID settings						
_	SSID settings						
(~) System overview 品 Ports settings	2.4G SSID						
🔶 WIFI settings \land	SSID name	Security type	SSID VLAN	Hide SSID	Guest mode 🎱	opera	ating
SSID settings	COMMANDO 2.4G	WPA-PSK+WPA2-PSK	2	Close	Close	edit Di	isabled
RF settings	Network1	WPA-PSK+WPA2-PSK	Close	Close	Close	edit E	Enable
↓ User control ~ 袋 System settings~		Open	Close	Close	Close	edit E	Enable
		Open	Close	Close	Close	edit E	inable

Fig 3.1.9 Wireless VAP 1 created in AIR-AP1200-PRO

	Network1	WPA-PSK+WPA2-PSK	Close	Close	Close	edit Enable
--	----------	------------------	-------	-------	-------	-------------

Fig 3.1.10 Enabling 2G Wi-Fi VAP 2 of AIR-AP1200-PRO

**Note:** You can have Multi SSID up to 8 (4 in 2.4G band and 4 in 5G band) configured on AIR-AP1200-PRO. All created SSID will use same channel in 2G and 5G band and channel width as set in for band SSID. For each Virtual Access Point (VAP) can set different name, encryption and password.

AIR-AP120 1.7.4 Build2	D-PRO 102206271431				仓	아 은 English
=>	WIFI settings > SSID settings					
- Surtem overview	SSID settings					
品 Ports settings	2.4G SSID					
🔶 WIFI settings \land	SSID name	Security type	SSID VLAN	Hide SSID	Guest mode 📀	operating
SSID settings	COMMANDO 2.4G	WPA-PSK+WPA2-PSK	2	Close	Close	edit Disabled
RF settings	Network1	W/DA-DSK+W/DA2-DSK	Close	Close	<u>Close</u>	edit <b>≻</b> Disabled
🖵 User control 🗸						
{ŷ} System settings~		Open	Close	Close	Close	edit Enable
		Open	Close	Close	Close	edit Enable

Fig 3.1.11 Enabling 2G Wi-Fi Network1 of AIR-AP1200-PRO

AIR-AP1200-PI 1.7.4 Build2022	RO 206271431				습 🖒 Զ English
$\Rightarrow$	WIFI settings > SSID settings				Ac
_	SSID settings				Tra AP1200-Audi 5G
(~) System overview 굡 Ports settings	COMMANDO 2.4G	WPA-PSK+WPA2-PSK	2	Close	HTM Cabin
🙃 WIFI settings \land	Network1	WPA-PSK+WPA2-PSK	Close	Close	Network1 Secured
SSID settings		Open	Close	Close	Connect automatically
KF settings		Open	Close	Close	Connect
ද⊖} System settings∨					Backup System 5G Airtel
	20 2210				A Backup System 2G-1 Airtel
	SSID name	Security type	SSID VLAN	Hide SSID	
	COMMANDO 5G	Open	Close	Close	AIR-AP1200 2G
		Open	Close	Close	Change settings, such as making a connection metered.
		Open	Close	Close	Image: Market in the second secon

Fig 3.1.12 2G Wi-Fi Network1 available for wireless clients AIR-AP1200-PRO

AIR-AP1200-Pi 1.7.4 Build2022	RO 206271431				<b>企</b> (	ኃ ዶ English
⇒	WIFI settings > SSID settings					
_	SS D settings					
(↔) System overview	Network1	WPA-PSK+WPA2-PSK	Close	Close	Close	edit Disabled
品 Ports settings		Open	Close	Close	Close	edit Enable
SSID settings		Open	Close	Close	Close	edit Enable
RF settings						
및 User control ∨	5G SSID					
\$Ô} System settings∨	56 3315					
	SSID name	Security type	SSID VLAN	Hide SSID	Guest mode 3	operating
	COMMANDO 5G	Open	Close	Close	Close	edit Disabled
		Open	Close	Close	Close	edit Enable
		Open	Close	Close	Close	edit Enable
		Open	Close	Close	Close	edit Enable

Fig 3.1.13 Default 5G Wi-Fi SSID of AIR-AP1200-PRO

1	5G SSID				°C.	Reception 5.8G
	SSID name	Security type	SSID VLAN	Hide SSID	ſ.	COMMANDO 5G
	COMMANDO 5G	Open	Close	Close	•	Commando Developer

Fig 3.1.14 Default 5G Wi-Fi SSID available for Wi-Fi Clients of AIR-AP1200-PRO

AIR-AP1200-P 1.7.4 Build202	RO 206271431				合	() 옥 English
=>	WIFI settings > SSID settings					
System overview	SSID settings			_		
品 Ports settings	COMMANDO 2.4G	SSID settings		×	Close	edit Disabled
🎅 WIFI settings \wedge	Network1	SSID name	SOMMNADO NETWORKS 5G		Close	edit Disabled
SSID settings		Security type	WPA-PSK+WPA2-PSK		Close	edit Enable
User control ~					Close	edit Enable
දිටුි System settings~		SSID password	••••••			
	5G SSID	SSID VLAN	Open			
	SSID name	SSID rate limit	Open		Guest mode @ Close	operating
		Hide SSID	Open		Close	edit Enable
		Guest mode	Open ( Prohibit mutual visits and access to win	ed )	Close	edit Enable
				Cancel Confirm	Close	edit Enable

Fig 3.1.15 Edit 5G Wi-Fi SSID setting of AIR-AP1200-PRO

5G SSID				<b>°</b> // co	mmando Develop	er
SSID name	Security type	SSID VLAN	Hide SSID	<b>1</b> 777, CC	MMNADO NETW	ORKS 5G
	Open	Close	Close	¶∕a Re	ception 2.4G	
	Open	Close	Close	Networ Change se	k & Internet settir ettings, such as makin	ngs g a connection metered.
	Open	Close	Close	<i>(ii</i> , Wi-Fi	ہے۔ Airplane mode	(۱) Mobile hotspot



AIR-AP1200-P 1.7.4 Build202	RO 206271431	SSID settings		×	<b>企</b> (	්) <mark>오</mark> English
=>	WIFI settings > SSID settings					
— (~) System overview	SSID settings	SSID name	Network5G			
Ports settings	COMMANDO 2.4G	Security type	WPA-PSK+WPA2-PSK		Close	edit Disabled
🄶 WIFI settings \wedge	Network1	CC1D 1			Close	edit Disabled
SSID settings		SSID password			Close	edit Enable
RF settings		SSID VLAN	Open			
🖵 User control 🗸			20		Close	edit Enable
දිලිෑ System settings~						
	5G SSID	SSID rate limit	Open			
	SSID name	Hide SSID	Open	- 1	Guest mode Ø	operating
	COMMNADO NETWORKS 5G	Guest mode	Open ( Prohibit mutual visits and access to wired )		Close	edit Disabled
			Cancel	firm	Close	edit Enable
			Cancor		Close	edit Enable
		Open	Close Close		Close	edit Enable

Fig 3.1.17 Setting VAP New SSID in 5G band of AIR-AP1200-PRO

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Network5G	WPA-PSK+WPA2-PSK	20	Close	Close		edit Enable		
5G SSID		_		<i>€</i> 776 co	MMNADO NETWO	RKS 5G		
SSID name	Security type	SSID VLAN	Hide SSID	A~				
COMMNADO NETWORKS 5	G WPA-PSK+WPA2-PSK	Close	elose	Tin Ne	Network5G			
Network5G	WPA-PSK+WPA2-PSK	20	Close	Rec	ception 2.4G			
	Open	Close	Close	Network & Internet settings Change settings, such as making a connection meter				
	Open	Close	Close	<i>(ii</i> , Wi-Fi		(۱) Mobile hotspot		
					Air piane mode	io spor		

Fig 3.1.18 VAP New SSID available for wireless clients in 5G band of AIR-AP1200-PRO

#### **RF** settings:

It provides an automatic power and channel adjustment function with Dynamic Frequency Selection (DFS) which makes channel allocation scheme specified for wireless LAN, in 2.4G and 5G Wi-Fi. It is designed to prevent electromagnetic interference to ensures particular RF detection and management algorithms to attain a better RF coverage effect. When the signals of one AP is interfering with by strong external signals, the AP may automatically switch to an appropriate channel to avoid interference, which guaranteeing larger distance covered. If particular AP deployed in the network accidentally stops operating by power failure or PoE switch OFF, the RF management function compensates the resulting blind area of signals so that the wireless clients can still operate normally.

**Setting Channel Bandwidth:** By default, the 2.4 GHz frequency uses a 20 MHz channel width, and the 5 GHz frequency uses a 80 MHz channel width. In crowded areas with a lot of frequency noise and interference, a single 20MHz channel will be more stable. 80MHz channel width allows for greater speed and faster transfer rates but it doesn't perform as well in crowded areas.

Standard	Frequency	Bandwidth	Modulation	Max Data Rate
802.11	2.4 Ghz	20 MHz	DSSS, FHSS	2Mbps
802.11a	5 Ghz	20 MHz	DSSS	54 Mbps
802.11b	2.4 Ghz	20 MHz	OFDM	11 Mbps
802.11g	2.4 Ghz	20 MHz	OFDM	54 Mbps
802.11n	2.4 and 5 Ghz	20 MHz, 40 MHz	OFDM	600 Mbps
802.11ac	2.4 and 5 Ghz	20, 40, 80, 80+80,	OFDM	6.93 Gbps
		160		



	Channel Width							
# Spatial Streams	20 MHz	40 MHz	80 MHz	160 MHz				
1	86 Mbps	200 Mbps	433 Mbps	866 Mbps				
2	173 Mbps	400 Mbps	866 Mbps	1.73 Gbps				
3	288.9 Mbps	600 Mbps	1.3 Gbps	2.34 Gbps				
4	346.7 Mbps	800 Mbps	1.73 Gbps	3.46 Gbps				
			and the second sec					

Fig 3.1.19 RF speed in 2.4G and 5G band of AIR-AP1200-PRO

For changing RF 2.4G setting go to WI-FI settings > RF settings >> 2.4G

AIR-AP1200-PI 1.7.4 Build2022	RO 206271431
=,	WIFI settings > RF settings
- System overview	RF settings
Ports settings	2.4G 5G
🄶 WIFI settings 🤸	Channel Auto 🗸
SSID settings	
RF settings	User Count Limit 256
🖵 User control 🗸	(0 unlimited)
ናርት System settings~	Min Access Signal94 +
2 <sub>0</sub> 3 - 7 <u>-</u> -	-95dBm -30dBm Disable
	Transmit Power 100% ~
	Channel Width 20 MHz 🗸
	Save Cancel

Fig 3.1.20 Changing Maximum Wireless client count in 2.4G band of AIR-AP1200-PRO

$\equiv$	WIFI settings > RF	F settings						
_	RF settings							
(~) System overview	2.4G	5G						
品 Ports settings								
🔶 WIFI settings \land			Channel	1		~		
SSID settings								
RF settings			User Count Limit	7				
□ User control ∨			\	8				
Con Sustam sattings			Min Access Signal	9			-94	+
τ <sub>Ω</sub> ς system settings ∘			-95	10				
			Transmit Power	11				
				12				
			Channel Width	13				
				Save	Cancel			

Fig 3.1.21 Changing Channels in 2.4G band of AIR-AP1200-PRO

$\equiv$	WIFI settings	> RF settings							
_	RF settings								
(~) System overview	2.4G	5G							
品 Ports settings									
WIFI settings      ^				Channel	1			~	
SSID settings									
RF settings				User Count Limit	100				
🖵 User control 🗸							(0 unlimite	d)	
Ch Suctom cottings			Γ	Vin Access Signal (	C			- 94	+
२८८४ System settings ∘				-950	dBm	-30dBm	Disable		
				Transmit Power	100%			~	
				Channel Width	100%				
					80%				
					60%				
					40%				
					20%				

Fig 3.1.22 Changing Transmit Power in 2.4G band of AIR-AP1200-PRO

$\equiv$	WIFI settings > RF settings		
	RF settings		
(*) System overview	246 56		
品 Ports settings	2.10 30		
🔶 WIFI settings \land		Channel 1 ~	
SSID settings			
RF settings		User Count Limit 100	
□ User control ∨		(0 unlimited)	
-		Min Access Signal O94	+
χ <sub>Q</sub> <sup>2</sup> system settings ∨		-95dBm -30dBm Disable	
		Transmit Power 100%	
		Channel Width 20 MHz	
		20 MHz	
		40 MHz	

Fig 3.1.23 Changing Channel width in 2.4G band of AIR-AP1200-PRO

$\Rightarrow$	WIFI settings > RF settings				
_ 	RF settings				
(⊶) System overview	2.4G 5G				
品 Ports settings					
🔶 WIFI settings \land		Channel	1	~	
SSID settings					
RF settings		User Count Limit	100		
🖵 User control 🗸				(0 unlimited)	
∰ System settings√		Min Access Signal	0	-	-94 +
		-950	dBm -30dBm	Disable	
		Transmit Power	100%	~	
		Channel Width	40 MHz	~	
			Save Cancel		

Fig 3.1.24 Configuration in 2.4G band of AIR-AP1200-PRO



Fig 3.1.25 Wi-Fi analysis 2.4G band of AIR-AP1200-PRO

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COMMANDO 2.4G	WPA-PSK+WPA2-PSK	2	Close	Close	edit Disabled
Network1	WPA-PSK+WPA2-PSK	Close	Close	Close	edit Disabled

Fig 3.1.26 SSID used for 2.4G band along with desired RF parameter of AIR-AP1200-PRO

AIR-AP1200-PI 1.7.4 Build2022	NO 06271431	企	ப	ዖ	English
$\Rightarrow$	WIFI settings > RF settings				
<ul> <li>Custom ouncieur</li> </ul>	RF settings				
品 Ports settings	2.4G 5G				
WIFI settings ^	Channel Auto ~				
SSID settings					
RF settings	User Count Limit 0				
🖵 User control 🗸	(0 unlimited)				
⟨Ď⟩ System settings∨	Min Access Signal O94 +				
	-95dBm -30dBm Disable				
	Transmit Power 100%				
	Channel Width 80 MHz ~				
	Save Cancel				

Fig 3.1.27 Default setting in 5G band of AIR-AP1200-PRO

WIFI settings > RF settings		
RF settings		
2.4G 5G		
Channel 3	6 ^	
User Count Limit	60	
	64	
Min Access Signal(	149	-94 +
-950 Transmit Power	157	
Channel Width	165	
s	ave Cancel	
Fig 3.1.28 Changing Channels in 5G band of AIR-AP1	.200-PRO	

WIFI settings > RF settings			
RF settings			
2.4G 5G			
	Channel 36 User Count Limit 100	V () unlimited)	
	Min Access Signal O -95dBm	-30dBm Disable	-94 +
	Transmit Power 100%	^	
	Channel Width 80%		
	60% 40%		
	20%		

Fig 3.1.29 Changing Transmit Power in 5G band of AIR-AP1200-PRO

WIFI settings > RF settings				
RF settings				
2.4G 5G				
	Channel 36	~		
	User Count Limit 100	(0 unlimited)		
	Min Access Signal 🔿	(0 ummitted)	-94 -	+
	-95dBm Transmit Power 100%	-30dBm Disable		
	Channel Width 80 MHz	^		
	20 MHz 40 MHz			

Fig 3.1.30 Changing Channel width in 5G band of AIR-AP1200-PRO

WIFI settings > RF settings		
RF settings		
2.4G 5G		
Channel	153 ~	
User Count Limit	100	
	(0 unlimited)	
Min Access Signal	O94 +	
-95	dBm -30dBm Disable	
Transmit Power	100% ~	
Channel Width	80 MHz ~	
	Save Cancel	

50

Fig 3.1.31 Configuration of channel in 5G band of AIR-AP1200-PRO



Fig 3.1.32 Wi-Fi analysis of 5G band of AIR-AP1200-PRO

<sup>51</sup> 

5G SSID

SSID name	Security type	SSID VLAN	Hide SSID	Guest mode 🕑	operating
COMMNADO NETWORKS 5 G	WPA-PSK+WPA2-PSK	Close	Close	Close	edit Disabled
Network5G	WPA-PSK+WPA2-PSK	20	Close	Close	edit Disabled
	Open	Close	Close	Close	edit Enable
	Open	Close	Close	Close	edit Enable

Fig 3.1.33 New SSID Network5G in 5G band of AIR-AP1200-PRO

## 4. User control

In user control get in User list of Wireless access user (Clients connected) along with Black and whitelist.

## 4.1 User list

Inbuilt intrusion prevention protects data and network clients and disallow unauthorized wireless client by blacklisting and whitelist.

For User List Click on, User control >User list

$\Rightarrow$	User control > Use	er list										
	User list	User list										
(**) System overview 믒 Ports settings	Wireless access user											
WIFI settings ~	User IP	User MAC	Associate S SID	Frequency band	time online	User signa I strength	Remark	operating				
🖵 User control \land						· · · · · · · · · · · · · · · · · · ·						
User list												
Black and white list												
ŚĈ⊱ System settings∽	< 1 >											

Fig 4.1.1 Default User List of AIR-AP1200-PRO

⇒	User control > Use	er list									
	User list										
(*) System overview 品 Ports settings	Wireless access us	ser									
🔶 WIFI settings 🗸	User IP	User MAC	Associate S SID	Frequency band	time online	User signa I strength	Remark	operating			
User list	192.168.188.30	20:a6:0c:37:4d:13	Network5G	5G	1970-01-01 05:34:07	-39dBm all		Modify user notes Prohibit networking			
Plack and white list											

Fig 4.1.2 User List of AIR-AP1200-PRO

## imes Network5G Networ... $\checkmark$

IP settings	Static ≎
IP address	192.168.188.30
Gateway	192.168.188.251
Prefix length	24

Fig 4.1.3 Connected wireless client of AIR-AP1200-PRO

Note:

FIUNY

You can also set DHCP Server is a network server that automatically provides and assigns IP addresses to wireless client devices. It relies on the standard protocol known as Dynamic Host Configuration Protocol or DHCP to respond to broadcast queries by clients.

INUNC Y

User control > Use	r list						
User list							
Wireless access us	er						
User IP	User MAC	Associate S SID	Frequency band	time online	User signa I strength	Remark	operating
192.168.188.30	20:a6:0c:37:4d:13	Network5G	5G	1970-01-01 05:34:06	-47dBm ull		Modify user notes Prohibit networking

Fig 4.1.4 Modifying connected user notes of AIR-AP1200-PRO

$\equiv$	User control > User list									
	User list									
子 System overview	Wireless access user	Modify user notes		×						
🙃 WIFI settings 🗸	l Iser IP	Remark	Mobile 5G WiFi		ark	operating				
🖵 User control \land						operating				
User list	192.168.188.30 2	192.168.188.30 2		Cancel Confirm		Modify user notes				
Black and white list						Prohibit networking				
{Ĝ} System settings∨	< 1 →									

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Fig 4.1.5 Changing User remarks AIR-AP1200-PRO

AIR-AP1200-P 1.7.4 Build202	RO 206271431			企		ዶ	English				
=>	User control > User list										
- Custom ausprimu	User list										
品 Ports settings	Wireless access us	reless access user									
🔶 WIFI settings 🗸	User IP	User MAC	Associate S SID	Frequency band	time online	User signa I strength	Remark		ope	rating	
User list Black and white list	192.168.188.30	20:a6:0c:37:4d:13	Network5G	5G	1970-01-01 05:39:10	-50dBm <b>atl</b>		Modify user notes Prohibit networking		es iing	
ŵ System settings~	< 1 >										

Fig 4.1.6 Disallowing user to access Wi-Fi for AIR-AP1200-PRO

### 4.2 Black and whitelist

In Blacklist Mode, MACs which are listed are forbidden to access the wireless network. In Whitelist Mode all MACs except whitelist are allowed to access wireless network.

ARR-AP1200-br

LTA Build/20206271431

User control > User list

User control > User list
User lis

For Black Whitelist users in network, Click on User control >Black and whitelist

Fig 4.2.1 Prohibit networking setting of AIR-AP1200-PRO

AIR-AP1200-F 1.7.4 Build202	RO 206271431	企	<u>ل</u>	으 English	
⇒	User control > Black and white list				
	Black and white list				
tree j System overview	Control mode . Riscklict mode	0			
品 Ports settings	Control mode O blackist mode O writelist mode	<b>e</b>			
ᅙ WIFI settings 🗸	User MAC/Remarks Q			→[	Add delete
User control ^	User MAC	Remark	c	operating	
User list					
Black and white list					
දÔjੇ System settings∨	< 1 >				

Fig 4.2.2 Add Blacklist Mac in AIR-AP1200-PRO

	AIR-AP1200-P 1.7.4 Build202	reo 206271431						企	Ċ	<u>റ</u>	English
		User control > Black and	User control > Black and white list								
_		Black and white list									
6-3			Add blacklist users			×					
÷		Control mode									
$\left(\left \cdot\right\rangle\right)$		User MAC/Remarks	* User MAC	20:a6:0c:37:4d:13					_[		delete
P					ı			on	eratino	1	
			Remark	Unauthorised User.	J					, 	
					Cancel	Confirm					
ţĈ}		< 1 >									

Fig 4.2.3 Add Blacklist User Mac in AIR-AP1200-PRO

$\Rightarrow$	User control >> Black and white list					
	Black and white list					
은 ) System overview 品 Ports settings	Control mode <b>O</b> Blacklist mode O Whitelist mode	0				
🄶 WIFI settings 🗸	User MAC/Remarks Q		Add delete			
	User MAC	Remark	operating			
User list	20:a6:0c:37:4d:13	Unauthorised User.	edit delete			
Black and white list 승ວ System settings~	< 1 →					

Fig 4.2.4 Blacklisted User in AIR-AP1200-PRO



Fig 4.2.5 Status of wireless client after Blacklist in AIR-AP1200-PRO

AIR-AP1200-F 1.7.4 Build202	RO 206271431	仚	Ċ	2	English
$\Rightarrow$	User control ( > Black and white list				
A) System overview	Black and white list				
品 Ports settings	Control mode 🔿 Blacklist mode 🔹 Whitelist mode 🔹				
$\widehat{\widehat{\gamma}}$ WIFI settings $\vee$	User MAC/Remarks Q Plock and white Pit			Add	delete
User control ^	User MAC		operatir	ng	
User list	In order to prevent current online users from being kicked offline by mistake, when switching to the 'whitelist				
Black and white list	mode', online terminals in the current network are				
දිලි System settings~	automatically added to the whitelist, and hey can be changed as needed in the future.           Cancel         Confirm				

Fig 4.2.6 Add whitelist Mac in AIR-AP1200-PRO

57

AIR-AP1200-Pi 1.7.4 Build2022	RO 206271431			企			
$\Rightarrow$	User control > Black and	white list					
Sustem oveniew	Black and white list						
Ports settings	Control mode	Add whitelist users	×				
<ul> <li>☐ Forts settings</li> <li>☐ WIFI settings ∨</li> </ul>	User MAC/Remarks	* User MAC					delete
□ User control ^		Remark		ol	perating	9	
User list		Remark					
Black and white list			Cancel Confirm				
₹Ĉ} System settings∨	< 1 >						



AIR-AP12 1.7.4 Build	0-PRO 202206271431				<u>ර</u> එ	2	English
$\Rightarrow$	User control > Black and	l white list					
C Surter and in	Black and white list						
品 Ports settings	Control mode	Add whitelist users		×			
🔶 WIFI settings	User MAC/Remarks	* User MAC	20:a6:0c:37:4d:13			Add	delete
및 User control ∽		Remark	Trusted User.		oper	ating	
User list					edit	delete	
Black and white	st			Cancel Confirm			
⟨Ĉ} System settings∖	< 1 >						

Fig 4.2.8 Add Whitelist User Mac in AIR-AP1200-PRO

AIR-AP1200-P 1.7.4 Build202	RO 206271431		企	Ċ Å	ද Er	nglish
$\Rightarrow$	User control > Black and white list					
_	Black and white list					
品 Ports settings	Control mode O Blacklist mode O Whitelist mode	0				
🔶 WIFI settings 🗸	User MAC/Remarks Q				Add	delete
□ User control ^	User MAC	Remark	c	perating		
User list	20:a6:0c:37:4d:13	Trusted User,	ec	dit delete		
Black and white list						
දÔj} System settings∨	$\langle 1 \rangle$					

Fig 4.2.9 Whitelisted User in AIR-AP1200-PRO

# 5. System settings

In System settings you can do Basic, Timing, Login, Device reboot and Restore.

## 5.1 Basic Setting

In basic setting, you can change Equipment Name, and AP Work Mode from FIT, FAT and Routing mode.

For Changing Basic settings, Click on System settings >Basic settings

AIR-AP1200 1.7.4 Build20	PRO 2206271431		企	Ċ	2	English
$\Rightarrow$	System settings > Basic settings					
- System overview	Basic settings					
品 Ports settings	Basic Information					
🔶 WIFI settings 🗸	* Equipment Name	COMMANDO				
🖵 User control 🗸						
ŵ System settings^	Work Mode	FAT-AP Mode 🗸				
Basic settings 🥌						
Timing setting		Save				
Login Management						
Device reboot						
Restore						

Fig 5.1.1 Default Basic setting of AIR-AP1200-PRO

System settings > Basic settings			
Basic settings			
Basic Information			
[	* Equipment Name	IT AP	
	Work Mode	FAT-AP Mode	
		Save	

Fig 5.1.2 Change equipment name of AIR-AP1200-PRO

<del>_</del> >	System overview > System overview				
— (F) System overview	System overview				
品 Ports settings	IT AP <b>CONNECTED</b> Extranet Already running: 4 m 12 s	Rate status ↓ 0 B/s ↑ 0 B/s	User information O Online user	0 Normal user	0 Weak signal user
Basic settings Timing setting Login Management	Device Information Equipment name: IT AP	Device model: AIR-AP1200-PRO	hardware information	on ) %	41.07 %
Device reboot Restore	IP address: 192.168.188.251 Firmware version: 1.7.4	MAC: 8C:02;FA:60:03:28	CPU	usage	Memory usage

## Fig 5.1.3 New Equipment name of AIR-AP1200-PRO



Fig 5.1.4 Default work mode of AIR-AP1200-PRO Note:- Default work mode of AP is FIT mode.

## 5.2 Timing Setting

With System Time you can schedule Wi-Fi availability and unavailability to wireless users and can configure Scheduled reboot.

For Changing	Timing setting click	on, System settings	s >Timing setting

AIR-AP1200-F 1.7.4 Build202	PRO 2206271431
=>	System settings > Timing setting
- System overview	Timing setting
品 Ports settings	Timed on
🔶 WIFI settings 🗸	First plan 🗌 Open
User control V	Second plan
२्0ू} System settings^	
Basic settings	Third alar Open
Timing setting	Third plan Open
Login Management	
Device reboot	Timed reboot
Restore	
	Reboot Regularly 🗌 Open
	Save Cancel
Fig 5.2.1 Default ti	ming setting for AIR-AP1200-PRO

<b>—</b> >	System settings > Timing setting
_	Timing setting
(↔) System overview	
品 Ports settings	limed on
$\widehat{\widehat{\gamma}}$ WIFI settings $\vee$	First plan 🗹 Open
🖵 User control 🗸	
දටුි System settings^	Cycle Weekly
Basic settings	Weekly
Timing setting	Once
Login Management	Monday Tuesday Thursday Thursday
Device reboot	Friday Saturday Sunday
Restore	Open Period 00:00-23:59

Fig 5.2.2 Setting cycle for wireless availability for AIR-AP1200-PRO

	Surtem settings Timing setting			
⇒	System setungs - mining setung			
	Timing setting			
System overview				
Ports settings	Timed on			
🄶 WIFI settings 🗸	First plan	Open		
및 User control 🗸				
🔅 System settings,	Cycle	Weekly		
Basic settings				
Timina settina		- All		
		Monday Tuesday Medaesday	Thursday Diday	Caturday.
Login Management		V Monday V Tuesday V Wednesday	Manufisuay Manufiuay	Saturday
Device reboot		Sunday		
Restore	Open Period	11:00-22:00		
	Second plan	Open		
	Third plan	Open		

Fig 5.2.3 Setting Days and period for AP available AIR-AP1200-PRO

System settings > Timing setting Timing setting	
Timing setting	
G- ) System overview Third plan _ Open	
WIFI settings     ✓       User control     ✓       Timed reboot	
ŵ System settings^	
Basic settings Reboot Regularly 🔽 Open	
Timing setting Cycle Once	~
Login Management	
Device reboot	
Restore	
Reboot Time 08:00	
Save	

Fig 5.2.4 Setting reboot for AP available AIR-AP1200-PRO

=>	System settings > Timing setting				
	Timing setting				
(~) System overview					
品 Ports settings		Third plan Dpen			
$\widehat{\widehat{\gamma}}$ WIFI settings $\vee$					
🖵 User control 🗸	Timed reboot				
දŷ; System settings^					
Basic settings		Reboot Regularly 🔽 Open			
Timing setting					
Login Management	:				
Device reboot		Once			
Restore		Weekly			
	Reboot Time	Reboot Time Per Month			
		Save Cancel			
Fig. 5.2.5 Selecting report frequency for AP available AIR-AP1200-PRO					

rig 5.2.5 Selecting report irequency for AP available AIR-AP1200-PRO

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Reboot Regularly	Open
Cycle	Once ~
	iii 2022-10-01
Reboot Time	08:00

Fig 5.2.6 Setting reboot frequency for AP available AIR-AP1200-PRO

## 5.3 Login Management

You can create password as per your choice and even change the admin password for login to device.

AIR-AP1200-PRO 1.7.4 Build202206271431							English
$\Rightarrow$	System settings > Login Management						
	Login Management						
Ports settings	Login Settings						
🔶 WIFI settings 🗸	* Old Password	••••••					
및 User control ∨							
{ᠿ System settings^	* New Password						
Basic settings							
Timing setting	* Confirm Password						
Login Management		Save Cancel					
Device reboot							
Restore							

Fig 5.3.1 Default Login setting for AIR-AP1200-PRO

Note: The factory default password is admin or commando depending on firmware version is mentioned in backside of device.

	System settings > Login Management				
~	_	Login Management			
6-3	System overview	Login Sattings			
뮮	Ports settings	Login settings			
((t·	WIFI settings 🛛 🗸	* Old Password	•••••		
Ļ	User control 🛛 🗸				
ţĊ	System settings^	* New Password	••••••		
	Basic settings				
	Timina settina	* Confirm Password	••••••		
	ining secting				
	Login Management		Save Cancel		
	Device reboot				
	Restore				

Fig 5.3.2 Setting New Password for AIR-AP1200-PRO



Fig 5.3.3 Login page for new password of AIR-AP1200-PRO

**Recommendation:** It is strongly recommended to change default password admin or commando which is used to access device.

## 5.4 Device reboot

It possible to reboot the AP by reboot command. The Internet connection will be temporarily interrupted while rebooting.

To reboot AP, click System setting> Device reboot



Fig 5.4.1 Default Device reboot for AIR-AP1200-PRO

System settings > Device reboot
Device reboot
Device reboot Prompt ×  The network will be interrupted during reboot. Do you want to continue? Cancel Confirm

Fig 5.4.2 Reboot for AIR-AP1200-PRO

## 5.5 Restore

Restore AP to known factory default configuration or to Reset to factory default settings. The Restore configuration feature allows end users to reset the AP to factory default settings. You can restore the AP to its factory default settings by the Reset button or by Reset Default option in this page. It must be noted that once the AP is reset, all the current configuration settings will be lost. Use the page to restore the AP to the factory defaults or use the button to restore the AP to old configuration.

To restore AP to factory setting, Click on System setting> Restore

	AIR-AP1200-Pl 1.7.4 Build2022	RO 206271431	企	Ċ	ዖ	English
	⇒	System settings > Restore				
6	System overview	Restore				
品	Ports settings	Restore				
((t-	WIFI settings 🗸 🗸	Restore				
ĉ	User control 🛛 🗸					
۲Ç	System settings^					
	Basic settings					
	Timing setting					
I	Login Management					
	Device reboot					
	Restore					

Fig 5.5.1 Default Restore button for AIR-AP1200-PRO

System settings > Restore		
Restore		
Restore		
	During the recovery, the set and the current network will you want to continue?	X tings will be initialized be interrupted. Do Cancel Confirm

Fig 5.5.2 Restoring AP to factory default for AIR-AP1200-PRO

## 6. COMMANDO Cloud

In FIT mode this AP can connect with cloud, and you can configure cloud settings under this option.

#### What is cloud service?

Cloud service focuses on managing the router. You can view and manage your devices, such as check the running status, modify the configuration, and set the authentication for captive portal.

### How to connect to cloud service?

Into cloud platform http://commandonetworks.com.cn/#/ ---> gets the binding code ---> enters the binding code in router and remark name ---> saves and completes the binding.

#### How to manage?

Wait about 3 minutes, you will see this device in your cloud account, you can manage and operate using your cloud account.

#### How to unbind the cloud?

Log in to cloud platform on the PC side and complete the unbundling of corresponding routes in the routing list -- equipment management -- routing information overview page.



How to create the account in COMMANDO cloud for login?

Go to any browser and type <u>http://commandonetworks.com.cn/#/</u>. Then AirPRO cloud login page as follows will appear.

Cloud	English
	AirPRO Cloud Login Username Password Login Remember Me Create Account Forgot Password?
Copyright © 201	2022 . All Rights Reserved. COMMANDO Networks

Copyright COMMANDO Networks



2		English
Reg	ister	
	Envil	
	Password	
	I agree to use this agreement Return to Login	

Fig 6.3 Register Cloud Login Email and password page

You can choose register Cloud Login Email and password as per choice of administrator. Note: Email ID should be a valid Email ID.

## Register

abc@gmail.com	
•••••	
•••••	
Verification Code	Get Email Verification Code
F	Register
I agree to use th	is agreement Return to Login

Fig 6.4 Email Verification code page

With help of R100 Controller you can bind with Cloud and can configure AP from cloud itself.

How to bind R100 with COMMANDO cloud login?

Login in the portal with created email credential and copy cloud binding code.



Fig 6.5 Cloud Binding page

Then take access of R100 connected to internet and go to System Setup > Cloud Account and bind that copied code to router ID.

					스) 슈 슈 온 English
	=<	System Setup	System Setup > Cloud Account		≣Ö≣ CPU: 82.81% 🛄 MEM: 26% ↑ TX: 1005.89 KB/s ↓ RX: 54.23 KB/s
$\sim$	System		Cloud Account		
6-3	Óverview	Basic Setting			
₫	Monitoring	Disk management			
ţĊ	System Setup	Cloud Account	Router ID :		
品	Network	Advanced 🗸 🗸	Account Code :	3991153401e1efe6d0b5cba6d348b126	
ţţţ	Flow Control	Administration $$	Comment :	Ticketing	
<b>P</b>	Access Controller	Upgrading 🗸 🗸			
<u>8</u> =	Authentication	Reboot			
\$	Behavior				
田	Firewall				
Ţ	Advanced application				
0 % 00	Services				
ľð	Log				

Fig 6.6 R100 Cloud Account Binding page

After binding code the cloud portal can access and configure R100 from anywhere in the world if having correct login credential.



Fig 6.7 Cloud login after binding page
							ත ර	수 은 English
	≡<	System Overview				📮 CPU: 10.15%	☐ MEM: 28% ↑ TX: 3	14.44 KB/s ↓ RX: 287.01 KB/:
$\mathfrak{S}$	System Overview	COMMANDO	Rate Status		Connection Status			
<u>-</u>	Monitoring	Connected wan	↑34.4 кв/s		24	495	0	Wired: 23
ţĊ	System Setup	Running: 10h 13m 18s	↓287 кв/ѕ		Online Host	Connection Count	Auth Count	Wireless: 1
品	Network							
ţţţ	Flow Control	Interface Status	<u> </u>	=	AC status	$\frown$	Frequency band	
<b></b>	Access Controller	Z I WAN Enabled LAN Enabled	03 DHCP Pool		$(\bigcirc)$	$(\bigcirc)$		
<u>8</u> "	Authentication		Addresses		AP connection is	AP connection	2.4G access	5G access
↔	Behavior				normal 1	disconnected	1	0
Ħ	Firewall	wan1 wan2 war	n3 lan1 veth5		I	0		
Ţ	Advanced application				Last 30 minutes tra	ffic analysis	Minutes V	
0% 00	Services					, Last St	/ Williaco *	
Ŀ	Log						HTTP	
Fig	6.8 R1	.00 device live access	page					

Cloud	Network Configurati	on Message	Personal	∾ Aੂ English		
Overview	1/1 Total User	1/1 Online User	<b>0/0</b> Authentication User/Accumulated Today	1 Each		
	<ul> <li>Webpage 68.4 GB</li> <li>Download 16.1 GB</li> <li>Other 15.2 GB</li> <li>Top 3 Traffic in 7 Days</li> </ul>	<b>123.8 GB</b> 7 Days Total Flow	27/38 Online Authenticated/Accumulated Today	5G 0 Each     2.4G 0 Each     Online Wireless Device     Total Wireless Traffic (Day) 82.8 GB		
	User Online Trend Total Use	r 🔳 New User 🔳 Old User		Last 7 Days Last 30 Days		

Fig 6.9 R100 cloud live access page

If password is forgotten, then following process to be followed.

How to recover from lost cloud portal password?

For recover from lost cloud portal password go to the cloud portal of COMMANDO and click Forgot Password.

Cloud		English
	AirPRO Cloud Login Username Password Login Remember Me Create Account Forgot Password?	

Fig 6.10 AirPRO forgot password page

2		English
	Email Password Reset	
	E-mail Verification	
	E-mail	
	OK	
	Return to Login	

Fig 6.11 AirPRO Email for password reset page

AirPRO [COMMANDO Networks] <airpro@commandonetworks.com> to me +



Fig 6.12 AirPRO Email received for password reset page

The reset email will send on email provided for request to recover or change the password for COMMANDO AirPRO account. Set a new password or change your password and said link will be valid for 2 hours only. <u>http://commandonetworks.com.cn/password/reset</u>. If you do not wish to recover/change your password or did not make this request, please ignore or delete this information. You can also contact COMMANDO support for any query.



Fig 6.13 AirPRO cloud login after password reset page

Cloud	Network Configuratio	n Message	Personal		୍ତ ନ୍≧ English
Overview	1/1 Total User	1/1 Online User	<b>0/0</b> Authentication User/Accumulate	Basic In Account Exit ed Today	formation t
	<ul> <li>Webpage 60.8 GB</li> <li>Other 16.2 GB</li> <li>Download 16.2 GB</li> <li>Top 3 Traffic in 7 Days</li> </ul>	<b>115.3 GB</b> 7 Days Total Flow	26/40 Online Authenticated/Accumulat	ed Today	■ 5G 0 Each ■ 2.4G 0 Each Online Wireless Device Total Wireless Traffic (Day) 98.3 GB
	User Online Trend Total User	New User Old Use	or		Last 7 Days Last 30 Days

Fig 6.14 AirPRO cloud login page

S	R	English
		中文
		English

Basic Information

Account

Exit



### 6.1 AirPRO Cloud Overview

A cloud-managed access point or networking solution allows business owners to manage Wi-Fi and network infrastructure over the cloud with zero maintenance charges, centralize control painlessly. This means businesses can connect to the cloud by subscribing to a pay-as-you-go, on-demand model.

Cloud	Network	Configuration	Message	Personal	ର୍ତ୍ତ Aੂ English
C Overview C Network	0/0 Total User		0/0 Online User	<b>0/0</b> Authentication User/Accumulated Today	0 Each
	<ul> <li>Webpage 0 B</li> <li>Download 0 B</li> <li>Transfer 0 B</li> <li>Top 3 Traffic in 7 I</li> </ul>	Days	<b>0 B</b> 7 Days Total Flow	<b>0/0</b> Online Authenticated/Accumulated Today	■ 5G 0 Each ■ 2.4G 0 Each Online Wireless Device Total Wireless Traffic (Day) 0 B

Fig 6.1.1 Default Cloud Overview page

Cloud	Network Config	uration Message	Personal	ରେ Pੂ English
<ul> <li>Overview</li> <li>Network</li> <li>Manage</li> </ul>	1/1 Total User	2/2 Online User	<b>0/0</b> Authentication User/Accumulated Today	1 Each
	Webpage324.5 MBMovie169.2 MBSocial142.1 MBTop 3 Traffic in 7 Days	7 Days Total Flow	<b>4/5</b> Online Authenticated/Accumulated Today	■ 5G 0 Each ■ 2.4G 0 Each Online Wireless Device Total Wireless Traffic (Day) 355 KB

Fig 6.1.2 Cloud Overview page







### 6.2 Network

Cloud Networking Solutions are Designed to Enhance Your access and IT infrastructure in which some or all of an organization's network capabilities and resources are hosted cloud account.

	loud	Network	Configuration	Message	Personal			\$ 8	English
() Overview	I	Network / Network							
🖳 Network									
		Bulk Configuration					Name		Q
		Name	Status ≑	GWID	Export IP	Version ≑		Status ≑	Config
					No Data				

Fig 6.2.1 Default Bulk configuration page

Clo	ud	Network	Configuration	Message	Personal					PEnglish
() Overview	Netw	ork / Network								
P Network										
🖓 Manage	В	ulk Configuration						Name		Q
		Name	Status ≑	GWID		Export IP	Version ≑		Status 韋	Config
		~ <u>testing</u>	Online	247ce0632ec8 d00818e8	88bde3e5053d6	182.59.62.184 (印度 )	3.4.5.CMD-C Id202011161	OS-v1.01 x32 Bui 736	Closed	<u>Config</u>
		Outline: Online Users: <b>4</b> Today's Certifi	cation <b>0</b>							
		Routing Maint	enance: Direct Login	Upgrade	Restart l	Jntie				
				Total 1	10/page $\vee$	< 1 > Go	to 1			
	<b>D</b>									

Fig 6.2.2 Bulk configuration page



Fig 6.2.3 Network Devices listed in Cloud page

Clo	Network ud	Configuration	Message	Personal					Æ	English
() Overview	Network / testing / G	ateway								
➡ Network A Manage	Return									
	Status wan1 lan1 • Connected	• Unconnected • Un	used Port 🏾 🖲 Uni	used NIC		Device Name: testing Model: R100-PRO Status: Online CPU Usage: 5,45% Memory Usage: 20% Version: 3,4,5,CMD-COS-v1.0 GWID: 247ce0632ec88bde3e	Online Users: 4 MAC: 08:9b:4b:50:1c: Running Time: 2 Hour 31 Minute 2Secc Binding Time: 2020-1 1 x32 Build202011161736 5053d6d00818e8	oc md 1-17 15:1	7:21	
	Device Load	CPU     Memo	ey 4:45 05-13 02:02	654 05-13 20-1	10:00 05-13	2/0-38-12 0/5-13 21-08-12 0/5-13	21:38:13 05-13 22:08:13 05-	3 22-38:12		

Fig 6.2.4 Gateway page

COMMANDO	Cloud	Netw	ork	Configuration	Message	Personal			୍ତ ନ୍ଥ	English
Overview	N	etwork / testi	ng / AP	List						
Network										
A Manage		Remarks		Q				Upgrade	Restart	Return
		Status 🤤	Remar	ks ⊋	Addre	ss: {0} 🤤	Version 🤤	Model 🤤	Operation	
		Online			08:9b	:4b:9e:f4:e3	1.5.9	AP	<u>View</u>	
		Online			08:9b	:4b:99:a3:94	1.6.6	AP	View	
					Total 2	10/page \vee	< 1 > Go to 1			

Fig 6.2.5 AP List page



Fig 6.2.5 Bulk configuration for particular AP Device page

Clou	ud	Network	Configu	ration M	essage F	Personal				S A	English
Overview	Net	work / Manage	ment								
Network											
Aanage №		testing									Q
		Device 🖨	IP ‡	MAC 🜲	AP_MAC 🜲	Total Tx 韋	Total Rx ≑	Total Time ≑	Online time	Operation	
		DESKTOP-7 0API5S	192.168.0.10 1	c4:d9:87:a7:a d:46	c4:d9:87:a7:a d:46	6.14 MB	61.47 MB	2 Hour 19 Minut e 11Second	2021-05-13 17:5 4		
			192.168.0.10 0	e0:db:55:be: 35:5b	e0:db:55:be: 35:5b	1.01 KB	11.43 KB	2 Hour 12 Minut e 32Second	2021-05-13 18:0 1		
		AP	192.168.0.10 2	08:9b:4b:9e:f 4:e3	08:9b:4b:9e:f 4:e3	680.00 Byte	708.00 Byte	2 Hour 30 Minut e 20Second	2021-05-13 17:4 3		
		AP	192.168.0.10 5	08:9b:4b:99:a 3:94	08:9b:4b:99:a 3:94	500.00 Byte	567.00 Byte	2 Hour 30 Minut e 5Second	2021-05-13 17:4 3		
					Total 4	)/page 🗸 <	1 > G	io to 1			

Fig 6.2.6 Network Management for all users' page

### 6.3 Configuration

The cloud authentication can be done with three server method namely Cloud Platform, Customize as per user requirement and Web-Radius. Cloud networking allows users to build networks using cloud-based services with help of certification process with Global Portal and WeChat Mini Program. A reliable cloud network provides centralized management, control and visibility, for example, managing devices in different physical locations using the internet. It can be used for connectivity, security, management and control.

Clo	Network C ud	Configuration Mes	age Person			Ś	Æ	English
Certificate	Authentication / Config Temp	plate 🕐						
(1) Wireless	Configure Gateway							
☐ Backup	Advanced Settings >	Template Server	Select Cloud Platform Customize Web-Radius Save	^				

Fig 6.3.1 Default Server Authentication selection page

Clo	Network ud	Configuration M	lessage	Personal			Ą	English
Certificate	Authentication / Config T	emplate 🕜						
®r® Wireless	Configure Gateway							
A Backup								
		Template	Ticketing					
		Server	Cloud Plat	form v				
		Certification Process:	Global Por	tal ^	0			
	Sel	ect Authentication Method:	Global Po	ortal				
			WeChat N	vlini Program				
			l					
		Choose A Template	Template 1		Configuration Page:			

Fig 6.3.2 Certification Process selection option page

User can select various Authentication Method as per choice/requirement. You can choose multiple method of authentications simultaneously.



### Fig 6.3.3 Authentication Method selection option page

迷 clo	Network Configuration Message Personal Jd
Certificate	Authentication / Config Template 🥥
00 Wireless	Configure Gateway
🛆 Backup	Template
	Server Cloud Platform
	Certification Process: Global Portal 📀
	Select Authentication Method:
	Choose A Template 1 Configuration Page:
	Select Networking Mode Network connection

Fig 6.3.4 Default Cloud platform configure gateway page

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Cloud	Network	Configuration	Message	e Personal
<ul> <li>Certificate</li> <li>Wireless</li> <li>Backup</li> </ul>	Free Certific	ation Setting ∨ Free cert	ification:	Add MAC addresses that do not require authentication here, in the format" 00: 00: 00: 00: 00: 01. Remarks "One per line
		https Domain Name V	Whitelist:	Enter the HTTPS domain name that can be accessed without authentication, the format is baidu.com, one per line
		https Domain Name V	Whitelist:	Enter the HTTPS domain name that can be accessed without authentication, the format is baidu.com, one per line
		Public IP	whitelist	Whitelist IP format: 8.8.8.8, 8.8.8.1- 8.8.8.255, 8.8.8.0/24 (one per line)
		Certificatio	on Range	All O Partial IP

Fig 6.3.5 Default Authentication Free certification setting page

Cloud	Network		Message	Personal	A	English
Certificate						
010 Wireless	Device Display S	Setting ~				
C Backup		iPhone Portal Pa	ige:			
		Android Portal Pa	age:			
		Timeout Sett	ing: After authe	0 Minutes need recertification		
			Cont	nued 0 Minutes need re-authenticate when no traffic		
			Note: Authe	itication mode configuration takes		
			Save			

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Fig 6.3.6 Default Authentication Device Display setting page

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Example 1:

Let us set Authentication/Config Template for Configure Gateway with Template named Ticketing with authentication Server platform as Cloud Platform with Certification Process as Global Portal along with Authentication Method as One-click Authentication.

Clo	Network Configuration Message	e Personal	
🕼 Certificate	Authentication / Config Template 📀		
아이 Wireless	Configure Gateway		
C. Backup			
	Template	Ticketing	
	Server	Cloud Platform	
	Certification Process:	Global Portal	0
	Select Authentication Method:	One-click Authentication	
	Choose A Template	Template 1	Configuration Page:

Fig 6.3.7 Authentication Config Template setting for example 1 page

Note: After adding a template, you can go to the" Network Management "page and use the" Bulk Configuration "option to deliver the template.

Close	ud	Network	Configuration	Message	Personal				S	P <sub>≜</sub> En	ıglish
() Overview	Ne	twork / Network									
Network	-										
Anage Anage		Bulk Configuration						Name		Q	
		Name	Status ≑	GWID		Export IP	Version ≑		Status 🖨	Config	
		~ <u>Ticketing</u>	Online	99024e99e09t 6ccb0c2	o6295028f3ab7f	106.201.231.25	3.6.5.CMD-C Id202207011	OS-v1.01 x32 Bui 908	Closed	<u>Config</u>	]
		Outline: Online Users:2	3								
		Today's Certific	cation 0								
		Routing Maint	enance: Direct Login	Upgrade	Restart	Intie					
				Total 1	10/page v	< 1 →	Go to 1				

Fig 6.3.8 Authentication Configuration in network setting for example 1 page



Fig 6.3.9 Authentication web page for example 1 page





Fig 6.3.11 Wi-Fi connected after Authentication Successful for example 1 page

COMMAND	Clou	d	Netwo	ork	Configuration	Message	Personal					S	A	English
🗵 Certifica	te	Cor	nfiguration /	Wireless										
♥ Wireless			Add											
			Template Name	Frequ ency Band	Preferred/ Secondary	SSID4 Security:	Hidde n Or Not	Guest	Bind NIC	MIN Access Sig nal	MAX Us ers	Timed On	Ope	ration
							No	Data						
			Tip: After addi	ng a temp	plate, you can go to the"	Network Managerr	nent "page	and use t	he" Bulk Con	figuration "option t	to deliver th	ne templa	te.	

Fig 6.3.12 Default Wireless add setting page

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CIO	Network Configuration Message Personal Dud	<u></u> ₽	English
() Overview	Network / Ticketing / Configure Gateway		
🕎 Network	Configure Gateway		
A Manage	Config Enable Authentication		

Fig 6.3.13 Default configure gateway setting page

Cloud	Network	Configuration	Message Pers	onal						S	ዶ	En
U Certificate		Template Name	COMMANDO									
979 Wireless				_								
G Backup		2.4G 5G	Extended functions									
		5GNetwork:										
	SSID1					SSID2						
		SSID1SSID Name	123				SSID2SSID Name					
		SSID4 Security:	No Password				SSID4 Security:	No Password				
		Bind NIC name	LAN3				Bind NIC name	LAN1 V				
		Hide SSID4 Name:	Enable				Hide SSID4 Name:	Enable				
		Guest	Enable(Prohibit mutus	al visits and access to win	ed)		Guest	Enable(Prohibit mutual visits and access to win	ed)			

Fig 6.3.14 Default Add 5G Wireless setting page

Clo	Network ud		Message	Personal		<u></u> ₽	English
Certificate	Configuration / Wireless	Template / Wireless					
<b>卵</b> Wireless	Wireless						
Backup							
		Template Name					
		2.46 56	Extended fur	actions			
		Timed On	Plan 1 Plan 2				
			Plan 3				
			Save	Cancel			

Fig 6.3.15 Default Wireless Configuration Extended function setting page

Cloud	Network	Configura	ation	Message	Personal
Certificate					
🕅 Wireless		Templat	e Name		
C Backup		2.4G	5G	Extended fu	unctions
		Tir	med On	Plan 1	
				Period: O	ne Time:
				One Time:	2021-04-10
				Time 00:00	-23:59
				Plan 2	
				Plan 3	
				Save	Cancel

Fig 6.3.16 Default Wireless Configuration Extended function for Plan 1 setting page

Clo	Network ud		Message	Personal		우들 English
Certificate	Configuration / Cloud I	Backup				
গ্য Wireless						
C Backup	Name	Q				
	News		CHUD	Manual David	Auto Declara	On and in a
	Name		GWID	Manual Back	кир: Айто васкир	Operation
				No Data		
			Total 0	10/page 🗸 < 1 >	Go to 1	

Fig 6.3.17 Default Configuration backup setting page

CEMMAND	Cloud	Network	Configuration	Message	Personal			S	Æ	English
I Certifica	te C	onfiguration / Cloud Ba	ackup							
010 Wireless										
Backup		Name	Q							
		Name		GV	NID	Manual Backup:	Auto Backup		Operatio	n
		testing		24 18	47ce0632ec88bde3e5053d6d008 8e8				<u>Edit</u>	
					Total 1 10/page 🗸 <	1 > Go to 1				

Fig 6.3.18 Default Backup Configuration setting page

COMMANDO Clou	Network	Configuration	Message Personal		S	A English
Certificate						
🕅 Wireless			Cloud Backup	×		
Backup			GWID: 247ce0632ec88bde3e5053d6d00818e8	3		
	Name		Router testing	_		
			Manual Backup: Backup Config			
			Automatic Backup			
			Period: Weekly Month			
			Weekly: Saturday 🗸			
			Moment: © 00:18			
			Save			
			Cancel			

Fig 6.3.19 Default Cloud Backup Configuration setting page

## 6.4 Message

COMMANDO	Clou	d	Network	Configuration	Message	Personal				₽	English
🖪 Log		Message	e / Log								
		La	ogin / logout	Upgrade / Restart	Configuration /	Operation		🛱 Start Date	To End Date	F	ilter
			Action		IP		1	lime			
			user logge	ed in cloud platform	10.172.128.19	16		2021-05-14 01:06:14			
			> user logge	ed in cloud platform	10.172.128.19	16		2021-05-13 22:55:24			
			user logge	ed in cloud platform	10.172.128.19	16		2021-05-13 22:22:39			
			user logge	ed in cloud platform	10.172.128.19	16		2021-04-22 23:57:55			
			b user logge	ed in cloud platform	10.172.128.19	16		2020-12-10 00:12:28			
			user logge	ed in cloud platform	10.172.128.19	16		2020-12-03 20:32:58			
			> user logge	ed out				2020-12-03 20:32:55			
			> user logge	ed in cloud platform	10.172.128.19	16		2020-12-03 20:27:22			
			o user logge	ed in cloud platform	10.172.128.19	16		2020-11-26 16:41:27			
			> user logge	ed in cloud platform	10.172.128.19	16		2020-11-26 11:56:52			

Messages can be Log, Login or logout, Upgrade or Restart and Configuration or Operation.

Fig 6.4.1 Default Login and Logout page

COMMANDO	Clouc	Network	Configuration	Message	Personal						۶	English
🖪 Log		Message / Log										
		Login / logout	Upgrade / Restart	Configuration /	Operation		Ē	Start Date	То	End Date		Filter
		Action		IP				Time				
						No Data						
				Total 0	10/page 🗸	< 1 →	Go to 1					

Fig 6.4.2 Default Upgrade and Restart page

	Cloud	Network	Configuration	Message	Personal						Ą	English
🖪 Log	1	Message / Log										
		Login / logout	Upgrade / Restart	Configuration /	Operation			Start Date	То	End Date		Filter
		Action		IP				Time				
						No Data						
				Total 0	10/page 🗸		Go to	1				

Fig 6.4.3 Default Configuration and operation page

COMMANDO	Cloud		Network Configure	ation Message	Personal	ි උ Englis	
🖪 Log	M	essage	/ Log				
		Log	in / logout Upgrade / R	Restart Configuration	/ Operation	🗎 Start Date To End Date Filter	
			Action		IP	Time	
		>	Close authentication		10.172.128.196	6 2022-09-15 13:31:26	
		>	Open authentication		10.172.128.196	6 2022-09-15 13:27:12	
		>	Delete template successfu	illy	10.172.128.196	6 2022-09-14 22:58:54	
		>	Close authentication		10.172.128.196	6 2022-09-14 22:58:49	
		>	Open authentication		10.172.128.196	6 2022-09-14 22:54:49	
		>	Close authentication		10.172.128.196	6 2022-09-14 22:54:24	
		>	Modify the template succ	essfully	10.172.128.196	6 2022-09-14 22:51:40	
		>	Delete template successfu	illy	10.172.128.196	6 2022-09-14 22:51:31	
		>	Add template successfully	/	10.172.128.196	6 2022-09-14 22:51:21	
		>	Save certification		10.172.128.196	6 2022-09-14 22:50:50	

Fig 6.4.4 Configuration and operation page

#### 6.5 Personal

Personal Information is available on this page.

Clo	Network ud	Configuration	Message		<u></u> ₽	English
A Information	About / Information					
🕀 Account						
	Account:		@gmail.com			
	Registration Data:	2020-09-30 18:4	45:10			
	QQ:		Modify			
	Mobile Number	999****2820	Modify			
	Binding Code			Ð		

Fig 6.5.1 Default Personal Information page

Clo	Network Pud	Configuration Message Personal	S	Æ	English
음 Information					
🛞 Account		Modify the bound phone $\qquad \qquad \qquad$			
	Account: Registration Data: QQ: Mobile Number	You are modifying the mobile number bound to the cloud platform. Please enter the following information to continue     Existing binding verification 2 New phone verification 3 Binding Success			
	Binding Code	Next			

Fig 6.5.2 Modify Personal Information page

# Frequently asked questions.

Protocol	Frequency Band	Compatibility	Theoretical Rate	Actual Rate
802.11a	5 GHz	N/A	54 Mbit/s	About 22 Mbit/s
802.11b	2.4 GHz	N/A	11 Mbit/s	About 5 Mbit/s
802.11g	2.4 GHz	Compatible with 802.11b	54 Mbit/s	About 22 Mbit/s
802.11n	2.4 GHz, 5 GHz	Compatible with 802.11a/b/g	450 Mbit/s (three spatial flows)	About 80 to 220 Mbit/s
802.11ac	5 GHz	Compatible with 802.11a/n	1300 Mbit/s	250 Mbit/s to 400 Mbit/s

# 1. What are the differences between 802.11a/b/g/n/ac Standards?

# 2. What is category of copper cable?

The different categories denote the frequency at which the cable will pass or fail at a number of parameter tests. In theory, the higher the frequency, the more data (megabits per second/Mbps) you can transmit. The word Category is often abbreviated as Cat. The common network cables include Category 5 cable (Cat 5), Category 5 enhanced (Cat 5e), & Category 6 cable (Cat 6). These are twisted pair cables that use RJ45 connectors, with a maximum transmission distance of up to 250 meters. Network cables also include Category 1 cable (Cat 1), Category 2 cable (Cat 2), Category 3 cable (Cat 3), Category 4 cable (Cat 4), Category 6a (Cat 6a), and Category 7 cable (Cat 7). Generally, a higher category indicates a later version, more advanced technology, and higher bandwidth and cost.

Also, depending on whether the shield layer is available, network category of cable cables changes. There are two types of cables namely, Shielded twisted pair (STP) and unshielded twisted pair (UTP). STP cables can reduce radiation and prevent information from being intercepted and external electromagnetic interference from entering. Compared with the same type of UTP cables, STP cables boast higher transmission rate, but they are more expensive and more difficult to install. UTP cables feature low cost, light weight, and are easy to bend. They rarely cause great impact on common networks. UTP cables are more widely used. To practically implement a full-duplex transmission rate of up to 10 Gbps, recommended to use Category 7 with STP.

Category of cable	Transmission frequency	Distance Covered
Cat5e	Up to 100Mhz	Supports 1GE (Gigabit Ethernet/1000Mbps) up to 100m
Cat6	Up to 250Mhz	Supports 10GE up to 5-10m
Cat6a	Up to 500Mhz	Supports 10GE up to 30m
Cat7	Up to 600Mhz	Supports 10GE up to 100m
Cat7a	Up to 1000Mhz	Supports 10GE up to 250m

## 3. What is MIMO?

MIMO (Multiple-Input Multiple-Output) to multiply the capacity of radio links which consists of multiple trans and receive antennas to forward data at the simultaneously generates multiple spatial streams, The receiving antennas can take out the signal from different spatial paths and reconstruct the original signal which ultimately increases transfer rates of up to 600Mbps.

## 4. What is Beamforming Technology?

Beamforming processes the signals sent by multiple antennas to generate a directional signal radiation pattern to boast signal from the transmitter helping to increase distance to receiver with improving in signal to noise ratio and ultimately increase signal coverage.

## 5. What are Beacon Interval, RTS Threshold?

Beacon Interval is the time between beacon frames transmitted by an access point. The AP radio will transmit one beacon for each SSID it has enabled at each beacon interval. Beacon Interval determines the time interval of the beacon frames sent by the AP device. RTS Threshold is the packet size, in bytes, that requires the AP to check the transmitting frames to determine if an RTS/Clear to Send (CTS) handshake is required with the receiving client.

## 6. What are physical interfaces generally used in networks?

Physical interfaces exist on interface cards and transmit service data. Physical interfaces are classified into the following types:

LAN Interface: They are 10/100/1000 Mbps ports to exchange data with network devices

on LANs. Following are common LAN interfaces used worldwide.

## 1. Fast Ethernet interface

A FE interface works at the data link layer, provides a maximum transmission rate of 100 Mbit/s, processes Layer 2 protocol packets, and implements Layer 2 forwarding.

# 2. Gigabit Ethernet interface

A GE interface works at the data link layer, provides a maximum transmission rate of 1000 Mbit/s, processes Layer 2 protocol packets, and implements Layer 2 forwarding.

# 3. 10 Gigabit Ethernet interface

A 10GE interface works at the data link layer, provides a maximum transmission rate of 10 Gbit/s, processes Layer 2 protocol packets, and implements Layer 2 forwarding.

## 4. MultiGE interface

It is an Ethernet electrical interface that can work at the rate of 1000 Mbps, 2500 Mbps, 5000 Mbps, or 10000 Mbps.

## 5. 40 Gigabit Ethernet interface

A 40GE interface works at the data link layer, provides a maximum transmission rate of 40 Gbps, processes Layer 2 protocol packets, and implements Layer 2 forwarding.

**Management interface:** Management interfaces are used to log in to switches for configuration and management purposes.

**USB interface:** It is a generally data transmission interface. You can perform USB based deployment on a switch through this interface.

**Mini USB interface:** It is a data transmission interface as well as management interface. You can perform basic configuration and management on a switch through this interface.

Monitoring Interface: Monitoring interfaces are used to monitor a switch's components, including the cabinet door, power supply, and backup power supply.

**Console interface:** The console interface is connected to the COM serial interface of a configuration terminal to set up an on-site configuration environment. This interface can be connected to a network interface of a configuration terminal or network management

workstation to set up an onsite or remote configuration environment.

**Out of band Eth interface:** This interface can be connected to a network interface with RJ45 cable of a configuration terminal or network management workstation to set up an onsite or remote configuration environment.

**Optical Interfaces:** In a fiber optic communications link, a point at which an optical signal is passed from one equipment or medium to another without conversion to an electrical signal. Depending on transmission rates, optical modules are classified into 100G, 40G, 10G, and 1G optical modules.

## 7. What are logical interfaces generally used in networks?

Logical interfaces do not physically exist. They are manually configured and can be used to exchange data and transmit service data.

**Trunk Interface:** A Trunk has Layer 2 and Layer 3 features and is formed by binding multiple Ethernet interfaces to provide more bandwidth and higher transmission reliability.

**Tunnel interface:** A tunnel interface has Layer 3 features, transmits packets, & identifies and processes packets transmitted over a tunnel.

VLAN interface: A VLAN interface has Layer 3 features and enables VLANs to have gateway IP.

**Ethernet Sub interface:** An Ethernet sub interface is configured on a main interface to allow the local L3 device to communicate with multiple L2 devices.

**Loopback interface:** A loopback interface is always UP and can be configured with a 32bit subnet mask.

**NULL interface:** A null interface is used to filter routes because any data packets received by the null interface are discarded

**NVE interface:** An NVE interface is the logical interface to establish VXLAN tunnels with other NVE devices.

**VBD interface:** A VBD interface is the virtual interface based on a BD to support Layer 3 features and implement communication between different BDs, between BD and non-BD networks, and between BDs and Layer 3 networks.

**Virtual Ethernet (VE) interface:** A VE interface is used when other data link layer protocols need to be carried by the Ethernet protocol. A VE sub interface can be created to allow an L2VPN to access to an L3VPN.

Layer 2 Interface: A L2 interface can act a switchport decides how to forward data based on the MAC address. They can only forward the received packets in Layer 2 switching mode or join VLANs to forward the packets in Layer 3 routing mode through VLAN interfaces.

Layer 3 Interface: Layer 3 interfaces forward packets to another device using static or dynamic routing protocols. You can use Layer 3 interfaces for IP routing and inter VLAN routing of Layer 2 traffic. IP addresses can be configured for these interfaces. They can forward the received packets in Layer 3 routing mode. That is, they can send and receive the packets whose source and destination IP addresses are located in different segments.

# 8. What are different types of VLAN within a private VLAN?

**Primary VLAN:** It can forward the traffic from the promiscuous ports to isolated ports, community ports and other promiscuous ports in the same private VLAN.

**Community VLAN:** It is a secondary VLAN. It forwards traffic between ports which belong to the same community and to the promiscuous ports. There can be multiple community VLANs per private VLAN.

**Isolated VLAN:** It is a secondary VLAN. It carries traffic from isolated ports to promiscuous ports.

## 9. What is ARP & how it works?

The basic purpose of the Address Resolution Protocol (ARP) is to resolve IP addresses to Ethernet mac addresses. It is the method by which any node or interface on a LAN can dynamically learn the MAC address of another IP host or router on the same LAN. The Address Resolution Protocol (ARP) is a communication protocol used for discovering the link layer address, such as a MAC address, associated with a given internet layer address, typically an IPv4 address.

ARP Request, is a message that makes the simple request "if this is your IP address, please reply with your MAC address." ARP also defines the ARP Reply message, which indeed lists both the original IP address and the matching MAC address. It is used to dynamically map layer-3 network addresses to data-link addresses. The ARP cache is vulnerable to ARP cache poisoning and ARP spoofing attacks. ARP table for all devices connected to it. The ARP table to obtain the MAC address of the device. The ARP table contains both static and dynamic addresses. Static addresses are manually configured and do not age out. The device creates dynamic addresses from the ARP packets it receives.

## 10. How DHCP Server works?

DHCP Server is used to dynamically assign IP addresses, default gateway and other parameters to DHCP clients. DHCP (dynamic host configuration protocol) allows a server to assign an IP address to a computer from a preselected range of numbers configured for a particular network. Dynamic Host Configuration Protocol (DHCP) is a network management protocol used to automate the process of configuring IP address, gateways and other IP related things automatically to connected hosts. DHCP Host/client generally require four IPv4 settings namely IP address, Subnet mask, Default Gateway IP and optional DNS server IP addresses. You can customize the DHCP pool subnet and address range to provide simultaneous access to more number of clients. DHCP allows both the permanent assignments of host addresses, but more commonly, DHCP assigns a temporary lease of IP addresses. With these leases, the DHCP server can reclaim IP addresses. DHCP also enables mobility by mac to IP binding.

# GLOSSARY

ACL: Access Control List can limit network traffic and restrict access to certain users, ports or mac by allowing and disallowing based on L2/L3/L4 information.

**ALG:** Application Level Gateway (ALG) is application specific translation agent that allows an application on a host in one address domain to connect to its receiver port running on a host in different address domain. It allows client applications to use dynamic TCP/UDP ports to communicate with known ports used by server applications.

**AH:** Authentication Header provides data origin authentication, data integrity, and replay protection. However, AH does not provide data confidentiality.

**ARP:** Address Resolution Protocol used to map an IP address to a MAC address in short converts between IP addresses and MAC addresses. ARP is used to locate the MAC address corresponding to a given IP address. This allows the switch to use IP addresses for routing decisions and the corresponding MAC addresses to forward packets from one hop to the next.

**BOOTP:** Boot Protocol is used to provide bootup information for network devices, including IP address information, the address of the TFTP server that contains the devices system files, and the name of the boot file.

**CFM:** Connectivity Fault Management provides fault monitoring for end-to-end connections within a designated service area by using continuity check messages which can detect faults in maintenance points, fault verification through loop back messages, and fault isolation with link trace messages.

**COS:** Class of Service is supported by prioritizing packets based on the required level of service, and then placing them in the appropriate output queue. Data is transmitted from the queues using weighted round-robin service to enforce priority service and prevent blockage of lower-level queues. Priority may be set according to the port default, the packet's priority bit (in the VLAN tag), TCP/UDP port number, IP Precedence bit, or DSCP priority bit.

**DDNS:** DDNS (Dynamic Domain Name Server) is a method of automatically updating a name server in the Domain Name System (DNS), often in real time, with the active DDNS

101 © 2022 COMMANDO Networks Inc. All rights reserved. configuration of its configured hostnames, addresses capability of assigning a fixed host and domain name to a dynamic Internet IP address.

**DHCP:** Dynamic Host Control Protocol provides a framework for passing configuration information to hosts on a TCP/IP network. DHCP is based on the Bootstrap Protocol (BOOTP), adding the capability of automatic allocation of reusable network addresses and additional configuration options.

DHCP SNOOPING: It is used to enhance network security by snooping on DHCP server messages to track the physical location of hosts, ensure that hosts only use the IP addresses assigned to them, and ensure that only authorized DHCP servers are accessible.

**DIFFSERV:** Differentiated Services provides quality of service on large networks by employing a well-defined set of building blocks from which a variety of aggregate forwarding behaviors may be built. Each packet carries information (DS byte) used by each hop to give it a particular forwarding treatment, or per-hop behavior, at each network node. DiffServ allocates different levels of service to users on the network with mechanisms such as traffic meters, shapers/droppers, packet markers at the boundaries of the network.

**DNS:** Domain Name Service used for translating host names for network nodes into IP addresses.

**DMZ:** DMZ (Demilitarized Zone) allows local hosts exposed to the Internet (untrusted Networks) additional protection and adds an extra layer of security to an organization's internal local-area network from untrusted traffic. The main goal of a DMZ is to allow an organization to access untrusted networks, such as the internet, while ensuring its private network or LAN remains secure.

**DSCP:** Differentiated Services Code Point Service uses a six-bit tag to provide for up to 64 different forwarding behaviors. Based on network policies, different kinds of traffic can be marked for different kinds of forwarding. The DSCP bits are mapped to the Class of Service categories, and then into the output queues.

**DSL:** Digital Subscriber Line that allows data to be sent or received over existing traditional phone lines that uses existing telephone lines to transport high-bandwidth data, Voice and video, to service subscribers. DSL provides dedicated, point-to-point,

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public network access.

**EAPOL:** Extensible Authentication Protocol over LAN is a client authentication protocol used by this switch to verify the network access rights for any device that is plugged into the switch. A username and password is requested by the switch, and then passed to an authentication server (e.g., RADIUS) for verification. EAPOL is implemented as part of the IEEE 802.1X Port Authentication standard.

**ERPS:** Ethernet Ring Protection Switching can be used to increase the availability and robustness of Ethernet rings, such as those used in Metropolitan Area Networks (MAN). ERPS provides Layer 2 loop avoidance and fast reconvergence in Layer 2 ring topologies, supporting up to 255 nodes in the ring structure. It can also function with IEEE 802.1ag to support link monitoring when non-participating devices exist within the Ethernet ring.

**ESP:** Encapsulating Security Payload provides data privacy services, optional data authentication, and anti-replay services. ESP encapsulates the data to be protected.

**EUI:** Extended Universal Identifier is an address format used by IPv6 to identify the host portion of the network address. The interface identifier in EUI compatible addresses is based on the link-layer (MAC) address of an interface. Interface identifiers used in global unicast and other IPv6 address types are 64 bits long and may be constructed in the EUI-64 format. The modified EUI-64 format interface ID is derived from a 48-bit link-layer address by inserting the hexadecimal number FFFE between the upper three bytes (OUI field) and the lower 3 bytes (serial number) of the link layer address. To ensure that the chosen address is from a unique Ethernet MAC address, the 7th bit in the high-order byte is set to 1 (equivalent to the IEEE Global/Local bit) to indicate the uniqueness of the 48-bit address.

**FTP:** File Transfer Protocol is a application layer protocol, is a way to download, upload, and transfer files on the internet or privet networks between computer systems. It allows transfer of files back and forth between VPN's, cloud or public networks.

**GARP:** Generic Attribute Registration Protocol is a protocol that can be used by end stations and switches to register and propagate multicast group membership information in a switched environment so that multicast data frames are propagated only to those parts of a switched LAN containing registered end stations.

**GMRP:** Generic Multicast Registration Protocol allows network devices to register end stations with multicast groups. GMRP requires that any participating network devices or end stations comply with the IEEE 802.1p standard.

**GMT:** Greenwich Mean Time also World Time, UTC nominally reflects the mean solar time along the Earth's prime meridian. Network Time Protocol (NTP) is a protocol that allows the synchronization of system clocks which is very convenient for log and troubleshooting purpose for events in networks.

**GVRP:** GARP VLAN Registration Protocol is a way for switches to exchange VLAN information in order to register necessary VLAN members on ports along the Spanning Tree so that VLANs defined in each switch can work automatically over a Spanning Tree network.

**H.323:** H.323 allows dissimilar communication devices to communicate with each other by using a standardized communication protocol. It defines a common set of CODECs, call setup, negotiating procedures, and basic data transport methods.

**HTTP:** Hypertext Transfer Protocol used by Web browsers and Web servers to transfer files, such as text and graphic files.

**ICMP:** Internet Control Message Protocol is a network layer protocol that reports errors in processing IP packets. ICMP is also used by routers to feedback information about better routing choices.

**IEEE 802.1D:** Specifies a general method for the operation of MAC bridges, including the Spanning Tree Protocol.

**IEEE 802.1Q:** VLAN Tagging—Defines Ethernet frame tags which carry VLAN information. It allows switches to assign end stations to different virtual LANs and defines a standard way for VLANs to communicate across switched networks.

**IEEE 802.1P:** An IEEE standard for providing quality of service (QoS) in Ethernet networks. The standard uses packet tags that define up to eight traffic classes and allows switches to transmit packets based on the tagged priority value.

**IEEE 802.1S:** An IEEE standard for the Multiple Spanning Tree Protocol (MSTP) which provides independent spanning trees for VLAN groups.

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**IEEE 802.1W:** An IEEE standard for the Rapid Spanning Tree Protocol (RSTP) which reduces the convergence time for network topology changes to about 10% of that required by the older IEEE 802.1D STP standard now incorporated in IEEE 802.1D-2004.

**IEEE 802.1X:** Port Authentication controls access to the switch ports by requiring users to first enter a user ID and password for authentication.

IEEE 802.3AC: Defines frame extensions for VLAN tagging.

**IEEE 802.3X:** Defines Ethernet frame start/stop requests and timers used for flow control on full-duplex links. (Now incorporated in IEEE 802.3-2002)

**IGMP:** Internet Group Management Protocol. A protocol through which hosts can register with their local router for multicast services. If there is more than one multicast switch/router on a given subnetwork, one of the devices is made the "querier" and assumes responsibility for keeping track of group membership.

**IGMP QUERY:** On each subnetwork, one IGMP-capable device will act as the querier that is, the device that asks all hosts to report on the IP multicast groups they wish to join or to which they already belong. The elected querier will be the device with the lowest IP address in the subnetwork.

**IGMP PROXY:** Proxies multicast group membership information onto the upstream interface based on IGMP messages monitored on downstream interfaces, and forwards multicast traffic based on that information. There is no need for multicast routing protocols in an simple tree that uses IGMP Proxy.

**IGMP SNOOPING:** Listening to IGMP Query and IGMP Report packets transferred between IP Multicast Routers and IP Multicast host groups to identify IP Multicast group members.

**IN-BAND MANAGEMENT:** Management of the network from a station attached directly to the network.

**Internet:** INTERNET stands for Interconnected Network systems that connects millions of web servers which provides a variety of information and communication facilities with standardized communication protocols.

105 © 2022 COMMANDO Networks Inc. All rights reserved. **IP MULTICAST FILTERING:** A process whereby this switch can pass multicast traffic along to participating hosts.

**IP PRECEDENCE:** The Type of Service (ToS) octet in the IPv4 header includes three precedence bits defining eight different priority levels ranging from highest priority for network control packets to lowest priority for routine traffic. The eight values are mapped one-to-one to the Class of Service categories by default but may be configured differently to suit the requirements for specific network applications.

**ISP:** Internet Service Provider provides individuals or organizations access to the internet and other telecom related services. An ISP has the equipment to have a point of presence on the internet for the geographic area served.

LACP: Link Aggregation Control Protocol allows ports to automatically negotiate a trunked link with LACP-configured ports on another device.

LAYER 2: Data Link layer in the ISO OSI 7-Layer Data Communications Protocol. This is related directly to the hardware interface for network devices and passes on traffic based on MAC addresses.

LAN: Local Area Network is a collection of devices connected together in one physical location, such as a building, office, or home. A LAN can be small or large, ranging from a home network with one user to an enterprise network with thousands of users and devices in an office or school.

**LINK AGGREGATION:** Link aggregation increases bandwidth, provides graceful degradation as failure occurs, and increases availability. It provides network redundancy by load-balancing traffic across all available trunk links.

**LLDP:** Link Layer Discovery Protocol is used to discover basic information about neighboring devices in the local broadcast domain by using periodic broadcasts to advertise information such as device identification, capabilities, and configuration settings.

**MAC address:** Media Access Control address is a hardware identifier that uniquely identifies each device on a network.

**MD5:** Message-Digest 5 is an algorithm that is used to create digital signatures. It is intended for use with 32bit machines and is safer than the MD4 algorithm, which has been broken. MD5 is a one-way hash function, meaning that it takes a message and converts it into a fixed string of digits, also called a message digest.

**MIB:** Management Information Base is an acronym for Management Information Base. It is a set of database objects that contains information about a specific device.

**MSTP:** Multiple Spanning Tree Protocol can provide an independent spanning tree for different VLANs. It simplifies network management, provides for even faster convergence than RSTP by limiting the size of each region, and prevents VLAN members from being segmented from the rest of the group.

**MRD:** Multicast Router Discovery is used by IGMP snooping and multicast routing devices to discover which interfaces are attached to multicast routers. This process allows IGMP-enabled devices to determine where to send multicast source and group membership messages.

**Multicast Switching:** A process whereby the switch filters incoming multicast frames for services for which no attached host has registered or forwards them to all ports contained within the designated multicast VLAN group.

**MVR:** Multicast VLAN Registration is a method of using a single network-wide multicast VLAN to transmit common services, such as such as television channels or video-ondemand, across a service-provider's network. MVR simplifies the configuration of multicast services by using a common VLAN for distribution, while still preserving security and data isolation for subscribers residing in both the MVR VLAN and other standard or private VLAN groups.

**MTU:** Maximum Transmission Unit is the largest size frame or packet. MTU is the largest packet or frame size, specified in octets, Standard Ethernet supports an MTU of 1500 bytes and Ethernet implementation supporting jumbo frames, allow for an MTU up to 10000 bytes.

**NAT:** Network Address Translator conserves IP addresses that are legally registered and prevents their depletion and provides security to access the internet with privacy by hiding the device IP address from the public network, even when sending and receiving traffic. NAT allows an organization with addresses that are not globally unique to

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connect to the Internet by translating those addresses into globally routable address space.

**NTP:** Network Time Protocol provides the mechanisms to synchronize time across the network. The time servers operate in a hierarchical master slave configuration in order to synchronize local clocks within the subnet and to national time standards via wire or radio. NTP Server NTP Server is used for synchronizing the time across computer networks.

**OAM:** Operation, Administration, and Maintenance provides remote management tools required to monitor and maintain the links to subscriber CPEs (Customer Premise Equipment). This section describes functions including enabling OAM for selected ports, loopback testing, and displaying remote device information.

**OSPF:** Open Shortest Path First (OSPF) is an open link state routing protocol. OSPF routers learn the entire network topology for their "area" (the portion of the network they maintain routes for, usually the entire network for small networks). OSPF routers send event driven updates. If a network is converged for a week, the OSPF routers will send no updates. OSPF has far faster convergence than distance vector protocols such as RIP.

**OUT-OF-BAND Management:** The device can be accessed from a station not attached to the network.

**PORT MIRRORING:** A method whereby data on a target port is mirrored to a monitor port for troubleshooting with a logic analyzer or RMON probe. This allows data on the target port to be monitored.

**PORT TRUNK:** Defines a network link aggregation and trunking method which specifies how to create a single high-speed logical link that combines several lower speed physical links.

**PRIVATE VLANS:** Private VLANs provide port-based security and isolation between ports within the assigned VLAN. Data traffic on downlink ports can only be forwarded to, and from, uplink ports.

QINQ QinQ tunneling: It is designed for service providers carrying traffic for multiple customers across their networks. It is used to maintain customer specific VLAN and

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Layer 2 protocol configurations even when different customers use the same internal VLAN IDs.

**QOS:** Quality of Service refers to the capability of a network to provide better service to selected traffic flows using features such as data prioritization, queuing, congestion avoidance and traffic shaping. These features effectively provide preferential treatment to specific flows either by raising the priority of one flow or limiting the priority of another flow.

**RADIUS:** Remote Authentication Dial-in User Service is a logon authentication protocol that uses software running on a central server to control access to RADIUS-compliant devices on the network.

**RIP:** Routing Information Protocol (RIP) is a dynamic routing protocol that uses hop count as a routing metric to find the best path between the source and the destination network. It is a distance vector routing protocol that has an AD value of 120 uses port number 520.

**RMON:** Remote Monitoring. RMON provides comprehensive network monitoring capabilities. It eliminates the polling required in standard SNMP and can set alarms on a variety of traffic conditions, including specific error types.

**RSTP:** Rapid Spanning Tree Protocol reduces the convergence time for network topology changes.

**SMTP:** Simple Mail Transfer Protocol is a standard host-to-host mail transport protocol that operates over TCP, port 25.

**SNMP:** Simple Network Management Protocol. The application protocol in the Internet suite of protocols which offers network management services.

**SNTP:** Simple Network Time Protocol allows a device to set its internal clock based on periodic updates from a Network Time Protocol (NTP) server. Updates can be requested from a specific NTP server or can be received via broadcasts sent by NTP servers.

**SSH:** Secure Shell is a secure replacement for remote access functions, including Telnet. SSH can authenticate users with a cryptographic key and encrypt data connections between management clients and the switch.

**STA:** Spanning Tree Algorithm is a technology that checks your network for any loops. A loop can often occur in complicated or backup linked network systems. Spanning Tree detects and directs data along the shortest available path, maximizing the performance and efficiency of the network.

**TACACS+:** Terminal Access Controller Access Control System Plus is a logon authentication protocol that uses software running on a central server to control access to TACACS compliant devices on the network.

**TCP/IP:** Transmission Control Protocol/Internet Protocol. Protocol suite that includes TCP as the primary transport protocol, and IP as the network layer protocol.

**TELNET:** It is a remote communication facility for interfacing to a terminal device over TCP/IP.

**TFTP:** Trivial File Transfer Protocol used for software/firmware downloads.

**UDP:** User Datagram Protocol provides a datagram mode for packet switched communications. It uses IP as the underlying transport mechanism to provide access to IP-like services. UDP packets are delivered just like IP packets – connection-less datagrams that may be discarded before reaching their targets. UDP is useful when TCP would be too complex, too slow, or just unnecessary.

**UTC:** Universal Time Coordinate is a time scale that couples Greenwich Mean Time (based solely on the Earth's rotation rate) with highly accurate atomic time. The UTC does not have daylight saving time.

**VLAN:** Virtual LAN is a collection of network nodes that share the same collision domain regardless of their physical location or connection point in the network. A VLAN serves as a logical workgroup with no physical barriers and allows users to share information and resources as though located on the same LAN.

**XMODEM:** A protocol used to transfer files between devices. Data is grouped in 128byte blocks and error-corrected.