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Carrier Grade Wireless Broadband IP Radio with Integrated Antenna

HIGH-CAPACITY LONG-RANGE OPTIMIZED FOR IP BACKHAUL

This platform deploys reliable and secure high-speed wireless IP connections between multiple remote locations through high-capacity Point to Point and Point to Multipoint links. Available in multiple frequency bands and configurations, it covers a distance of up to 40 km.

Shyam's Wireless Broadband IP Radio Unit incorporates the latest technologies such as MIMO, OFDM and Diversity bundled with Shyam's proprietary protocols. The Carrier Grade Solution ensures 24/7 connectivity with zero network downtime. The solution can also be installed in a Multiple Point to Point architecture; multiple units are deployed on the same tower, where they provide a dedicated high-capacity connection to each remote site.

FEATURES

- **Optimized Transmission Cost:** Control your transmission cost by avoiding the need to use fiber and leased lines. Significantly reduces CAPEX and OPEX.
- **Rapid Deployment:** This solution is provided as a Plug-and-Play solution for rapid deployment. Dismantling and redeployment of the unit is speedy as well.
- **Sensible Business Case:** The unit directly contributes to your bottom line as it offers the most cost-effective way to provide high bandwidth as well as network expansion.
- **Single Integrated Voice and Data Solution:** Can connect routers via Ethernet to provide a Single Voice & Data Link for customers. The revenue generating potential for this application is immense.
- **All-Weather Reliability:** Our system is outdoor capable and rugged enough to withstand extreme weather conditions. The system is maintenance free.

HIGHLIGHTS

- Carrier Grade Performance Reducing Operational Expenses And Revenue Loss Due to Service Interruptions
- Very Low Power Consumption
- Long Range with Modular, Scalable Capacity
- Available in External and Integrated 18/21 dBi Antenna Options
- MIMO & OFDMA Technologies
- Flexible Architechture: Point to Point, Multiple Point to Point and Point to Multi Point
- Long Range - Up to 40 km (Depending on Terrain, Frequency, etc.)
- Robust Systems; Operational in nLOS, High Interference and Harsh Weather Conditions
- Very Simple Installation and Maintenance
- Remote Power through PoE
- TDD - TDMA Duplex Technique Suitable for Both TDM and Ethernet Services
- License Exempt Frequencies (2.4 and 5.8 GHz) with Security
- Multiple Data Rate Options (18/50/100 Mbps)

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NO.	MODEL NO.	PRODUCT DESCRIPTION
1.	RM-24 (-XXXX)	2.4 GHz with Integrated Antenna/ P2P & P2MP (refer to FCC ID : ZO7-RM24-AP25)
2.	AP25 (-XXXX)	2.4 GHz with Integrated Antenna / Access Point (refer to FCC ID : ZO7-RM24-AP25)
3.	RM-58 (-XXXX)	5.8 GHz with Integrated Antenna/ P2P & P2MP (refer to FCC ID : ZO7-RM58)

SYSTEM

Type	Outdoor
Mounting	Wall and Pole Mount
Frequency Bands	2.412 - 2.462 GHz 5.745 -5.825 GHz
Rx Sensitivity (dBm) **2.4 / 5.8 GHz**	16 QAM: -85 64 QAM: -75 MCS0 HT20: -92 MCS0 HT40: -90 MCS7 HT20: -73 MCS7 HT40: -71
Link Topology	Point to Point Point to Multipoint Multiple Point to Point Using Burst Synchronization Technique
Interface b/w IDU & ODU	Outdoor Cat5/6e Cable
Dimension	52.5 x 138 x 275 mm

FEATURES

Channel Bandwidth	10/20/40 MHz
Duplex Technique	TDD
Modulation	OFDM - 16QAM/64QAM
MCS	1 - 15
Encryption	WEP, AES
Adaptive Modulation & Coding	Supported
Automatic Channel Selection	Supported
Diversity Support	Supported
Error Correction	Supported
Hub Site Synchronization	Supported
Framing/Coding	IEEE 802.3/U
Bridging	Self-Learning Up to 2047 MAC Addresses IEEE 802.1Q

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FEATURES

SFP Port	Optional
Latency	3 msec (Typical)
Maximum Frame Size	1536 bytes
VLAN Support	Transparent
Dynamic Bandwith Management	Supported
DFS	Supported
Site Survey Tool	Supported

POWER

Power Supply	24 - 48 V DC, PoE
Max Power Consumption	7 W

INTERFACES

Ethernet		
Type	10/100 Base-T Interface with Auto-negotiation (IEEE 802.3) 10/100/1000 Base-T Interface with Auto-Negotiation (IEEE 802.3)	
Number of Ethernet Ports	1	
Connector	RJ-45	
RF		
Antenna Port	N-Type (1,2) (Only for Unit with External Antenna Option)	
Integrated Antenna Specifications	**Upto 18 Mbps/Upto 100 Mbps**	
Frequency Band	2.310 - 2.900 GHz	4.940 - 6.030 GHz
Gain	18 dBi typical	21 dBi typical

INTERFACES

Beam Width (Horizontal/Vertical)	25° (Typical)	8° (Typical)
Polarization	Cross Polarized	Vertical or Horizontal

MANAGEMENT

Network Management	SNMP Embedded Web Server
Firmware Upgrade	Local & Remote
Software Management Application	Proprietary Management Software

ENVIRONMENT

Water & Dust Protection	IP67
Operating Temperature	-20° to 70° C (-4° to 158° F)
Humidity	Up to 95% (Non-Condensing)

REGULATION

RADIO	
FCC : 47CFR	Part 15, Subpart C
C&B	
IC	RSS-210
SAFETY	
TUV	60950, According to UL 60950
CAN-CSA	C22.2 No. 60950
EMI/EMC	
Standard Support	CISPR-22
ENVIRONMENTAL	
Environmental Standard	Category D of QM333

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This device complies with Part 15 of the FCC Rules. Operation is
subject to the following two conditions: (1) this device may not cause harmful
interference and (2) this device must accept any interference received, including
interference that may cause undesired operation.

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Changes of modifications not expressly approved by the manufacturer could void
the user's authority to operate the equipments.

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This device has been designed to operate with the antennas listed below, and having a maximum gain of 18dB typical for 2.4G Band and 21dB typical for 5.8G Band. Antennas not included in this list or having a gain greater than mentioned typical are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

Antenna (or equivalent) list:

- □ 2.4G Band Patch Antenna: 401.00023.00; 18+/- 0.5 dB gain.
- □ 5.8G Band Patch Antenna: 102.00018.00; 21+/- 1.0dB gain.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropic radiated power (e.i.r.p.) is not more than that permitted for successful communication.

□ □□□□□□**!**□This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. For mobile or fixed location transmitters, the minimum separation distance is greater than 20 cm , even if calculations that the MPE distance would be less.

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MINIMUM REQUIREMENTS

- PC with 200 MHz or Faster Processor
- 32 MB RAM Memory
- Internet Explorer 6.0 or Higher, Netscape Navigator 8.0 or Higher, Firefox 3.0 or Higher for Web-Based Configuration
- Windows 2000 or XP
- Installed per PC or Network Adapter with Ethernet
- Network Cable and TCP/IP Protocol Installed per PC

PACKAGE CONTENTS

- ODU
- Mounting Clamp
- Ethernet Cable (Optional)
- External Antenna (Optional)
- PoE Injector
- CD (Containing Installation Manual)

ABOUT SHYAM NETWORKS

Shyam Networks provides state-of-the-art networking and security solutions for diverse corporate enterprises, governments, educational institutions, offices and residences. From high end enterprise network solutions and wireless broadband connectivity to simple broadband access for homes, we ensure speed, capacity and range for both outdoor and indoor applications. We understand your networking needs as they evolve in a dynamic environment and manage them with cost effective, innovative answers.
Shyam Networks offers end-to-end solutions for homeland security, industrial security, and mission critical, sensitive sectors. We also offer a range of products that bring you an enhanced internet experience, in dense urban locations or remote rural areas where power and infrastructure are unreliable. Shyam Networks has networking solutions to connect subscribers in even the most challenging environments.

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SHYAM NETWORKS

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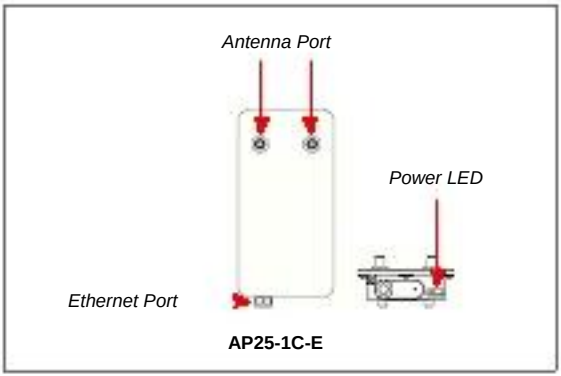
Quick Start Guide [illegible]

Package Contents

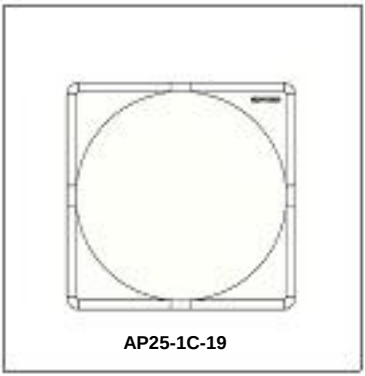
Carrier Grade Access Point (main unit)	1
PoE Adapter	1
Mounting Kit	1
Quick Start Guide	1

For advanced settings and more detailed information, download the user manual from www.shyamnetworks.com.

1. Hardware Overview



AP25-1C-E



AP25-1C-19

Available Models

MODEL	DESCRIPTION
AP25-1C-E	AP25 that supports external antenna. Two reverse-TNC type RF connectors are provided on the end of the unit to support antenna configurations.
AP25-1C-19	AP25 with integrated 18 dBi (typical) antenna. In this, the antenna is covered with a radome to protect it from environmental elements.

Note: The antennas are not shipped with 'AP25-1C-E'. For this model, you need to procure the external antennas separately. For this, please contact at customer.care@vnl.in.

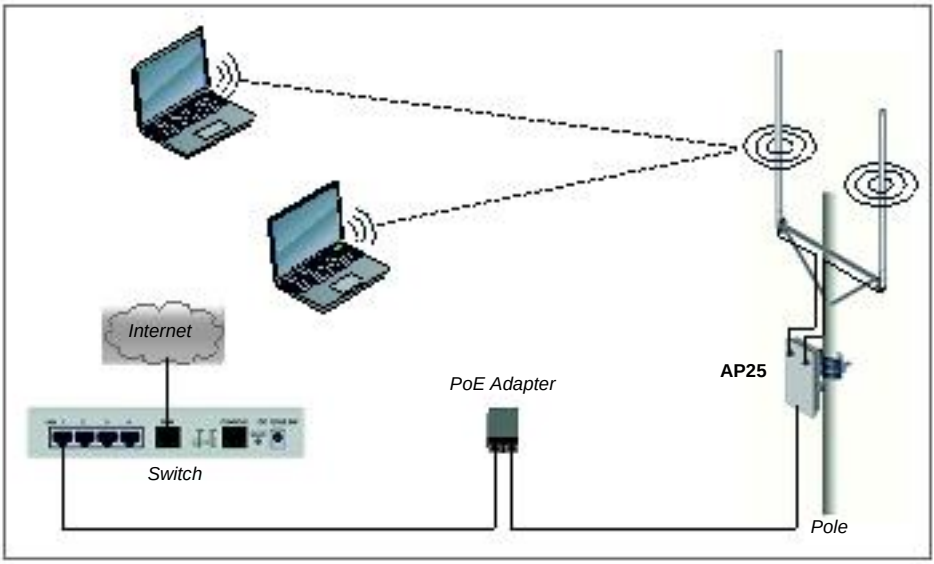
Interface Description

INTERFACE	DESCRIPTION
Antennas	Integrated or external antennas depending on the model.
LAN 1	One local area network (LAN) port providing connection through Cat5e cables, depending on the model.
Power	PoE 24V to 48V (preferred 48V).
LED	Power LED indicates power connection status.

Caution and Warnings

- Use the PoE adapter included with the product. Using a different PoE adapter may damage the product.
- Do not work on the system or connect or disconnect cables during lightning.
- Use an appropriate antenna to improve range (coverage).
- While mounting AP25, choose an elevated location where trees, buildings, and large steel structures do not obstruct the antenna signals and offers the maximum line-of-sight propagation to the users.
- Place AP25 as close as possible to the area where users require to access to the wireless local area network (WLAN).

2. Installing AP25



STEP 1 Connect one end of an RJ45 Ethernet cable to the LAN OUT port of the adapter and the other end to the LAN of AP25.

Note: You need one Category 6 (Cat 6) Ethernet cable with RJ-45 connector. Maximum length of the RJ45 Category 6 cable is 100 meters for up to 200mW radio. For high power radio frequency, use a high rating PoE adapter.

STEP 2 Connect the RJ45 Ethernet cable attached to the PoE adapter to a network device, such as a switch or to the system that you use to configure AP25.

Note: PoE power input: Passive PoE (Preferred 48V DC).

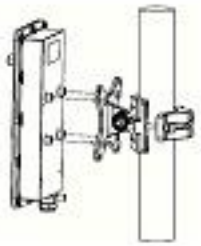
STEP 3 Connect the PoE adapter to the main electrical supply and the power cord plugged into the socket of the adapter. Now, turn on the power supply. AP25 starts receiving power through the PoE adapter.

STEP 4 Verify the availability of power to AP25 by checking the power LED. Green color indicates input power is being supplied to the AP25. In case AP25 is not powered-up, please refer "*Quick Troubleshooting*"section.

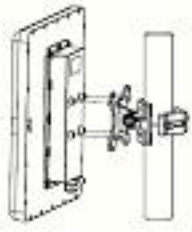
Congratulations! The installation of AP25 is complete.

3. Mounting AP25 on the Pole

STEP 1 Place AP25 on the pole at proper position.



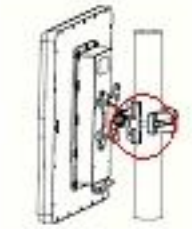
AP25 with External Antenna



AP25 with Integrated Antenna

STEP 2 Attach the clamp to AP25 along with the pole and tighten the screws.

AP25 with External Antenna



AP25 with Integrated Antenna

Now, AP25 is mounted on the pole.

AP25 with External Antenna

AP25 with Integrated Antenna

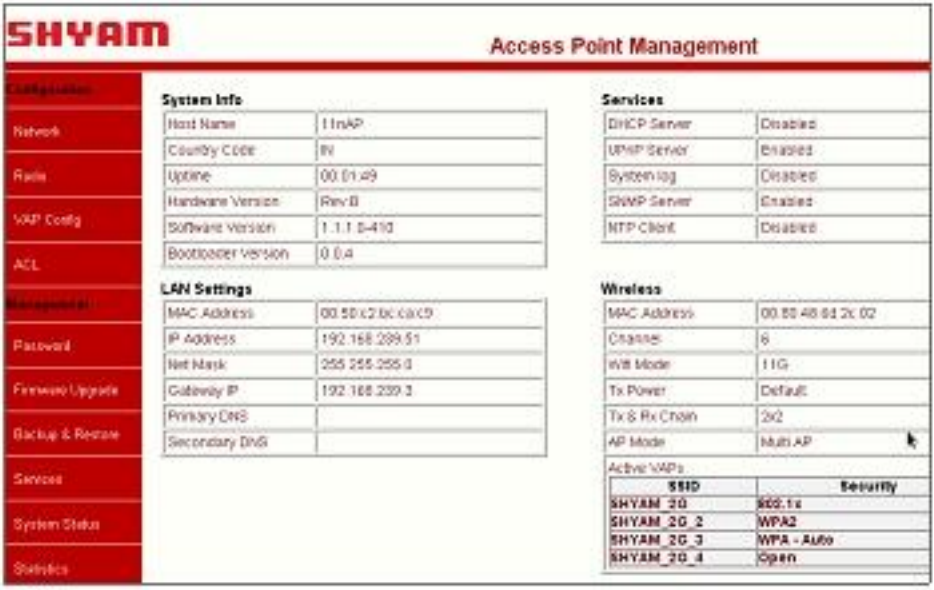
4. Configuring AP25

STEP 1 Power-up AP25.

STEP 2 Set the IP address of the system to **192.168.1.x** and subnet mask to **255.255.255.0**, where x is a number between 1 and 254, except 2 as the default IP address of AP25 is 192.168.1.2.

STEP 3 Type the **http://192.168.1.2** URL in the Internet Explorer 6.0 or above version to access the web interface.

STEP 4 Provide user name as **admin** and password as **password** to access the GUI of the AP25 web-based utility.



Please refer to "*AP25 Configuration and User Guide*" for more details.

5. Quick Troubleshooting

PROBLEM	PROBABLE REASON	RESOLUTION
Problem in accessing AP25 web page through LAN port.	AP25 not powered-up LAN Ethernet cable is not connected properly.	Ensure that the PoE adapter is powered on and power LED is lit. Ensure that the Ethernet cable from AP25 is connected to the PoE port of the PoE adapter and the cable from the computer/laptop is connected to data port of PoE adapter.
Not able to scan configured SSID of AP25.	Hidden SSID option configured in AP25.	Check for hidden SSID option in AP25. In case this option is enabled, disable the same to get the SSID scanned on laptop.
Problem in establishing wireless connectivity between AP25 and laptop.	AP25 unit is not broadcasting SSID. Wireless security setting mismatch. Either laptop is not assigned a valid IP address or the IP address is not registered with AP25.	Connect to AP25 using LAN port and make sure that it is configured in the AP mode (Standard/RootAP/MultiAP/ Multi VLAN). Match the security settings between laptop and AP25. Ensure that the DHCP client is enabled in laptop and DHCP server (configured on AP25) is available in AP25 or DHCP server available in the backbone.

Warranty

This warranty is valid upto 12 months from the date of purchase.
Any manufacturing defect will be repaired by the company free of charge within the period of warranty subject to the following conditions:

1. This warranty card must be duly filled in, stamped & signed by the dealer. The card and the relevant cash memo must be preserved & produced along with the defective unit.

2. Once the defective unit is repaired during the said warranty period, the warranty shall thereafter continue only for the unexpired period to the original warranty.

3. This warranty is not valid for

- Damage resulting from accidents, mishandling, negligence, tampering, unauthorized repair, failure to follow instructions, lightning, fire and act of God.
- Items not purchased from Authorized Dealers of the Company.
- Batteries (including rechargeable) wherever applicable.
- Damage to the tamper proof seal.

4. In case of a problem with your unit, please contact Customer Care. In the event that you are advised to send and collect the unit from the Service Center of the Company - the same will be done at your expense.

5. While Company or its Authorized Service Dealer will make every effort to carry out repairs under this warranty as soon as possible, it is expressly made clear that the company shall not be held liable for any direct or indirect loss to user due to delay in providing this service.

6. This warranty excludes every condition/warranty/liability not expressly set out therein.

7. Claims, if any to this warranty shall be subject to the courts having jurisdiction in Delhi, India.

Product _____

Model No. _____ Serial No. _____

Dealer's Stamp & Signature

Customer Care,
Shyam Networks (A Division of Vihaan Networks Ltd.)
21-B, Sec-18, Udyog Vihar, Gurgaon-122015
Haryana, India

Email: customer.care@vnl.in
All India Helpline No. - +91 124 309 2000 Ext. 2009,
+91 9873573710

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