Product Specifications

5G NR Cellular + Wi-Fi 6 AX 1800 Dual Band + 1-Port 1000X SFP VPN Security Router

VR-300FW-NR

Version 1.0

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Change History:

Revision	Date	Author	Change List
Version 1.0	2022/11/8	Sky	Initial release

Author	Sky	Editor :	Mark
Reviewed by:	Kent	Approved by:	Kent

1. PRODUCT DESCRIPTION

Powerful 5G NR and Wi-Fi 6 Enterprise Network Solution

The innovation of the Internet has created tremendous worldwide opportunities for e-business and information sharing. It has become essential for businesses to focus more on network security issues. The demand for information security and wireless connetion has become the primary concern for the enterprises. To fulfill this demand, PLANET has launched the all-in-one VR-300FW-NR 5G NR Cellular + Wi-Fi 6 VPN Security Router. It is able to provide ultra-fast broadband access with 5G cellular network. The VR-300FW-NR also features five Ethernet ports (4 LANs and 1 LAN/WAN), one **Fiber** port (LAN/WAN), **IEEE 11ax Wi-Fi** capability, and VPN technology bundled in a compact yet rugged metal case. It establishes a fast cellular connection between the Ethernet equipped devices. The VR-300FW-NR is an integrated 5G NR and Wi-Fi 6 solution for System Integrators, ISPs and Enterprises.

The VR-300FW-NR also carries several main categories across your network security deployments: **Copper/fiber WAN interface**, **cybersecurity**, **SPI firewall security protection**, **policy auditing (content filtering, VPN tunnel and MAC/IP filtering)**, **AP controller, captive portal, RADIUS** and **easy management (Setup Wizard, DHCP Server** and **Dashboard**). Furthermore, its Dual-WAN Failover, Outbound Load Balance and High-Availability features can improve the network efficiency while the web-based interface provides friendly and consistent user experience.

Automatic Failover between 5G NR and Dual WAN

Designed with 5G NR, dual WAN interfaces (fiber and copper), 1000X SFP and Gigabyte Ethernet, the VR-300FW-NR ensures Internet connectivity by featuring failover functionality between 5G NR and dual WAN. It provides flexibilty to set priority for 5G NR or dual WAN connection. When the main WAN interface fails, the secondary WAN interface will automatically back up the connection to ensure always-on connectivity.

Ultra-Fast Speed 4G/5G Network*

The VR-300FW-NR supports 5G NR DL (downlink) speeds higher than 2.4 Gbps and 4G LTE DL speeds of up to 1 Gbps. The wide spectrum bandwidth accelerates internet speeds and reduces network latency for premium and time-sensitive connectivity services. It also supports multi-band connectivity including LTE FDD/TDD, WCDMA and GSM for a wide range of applications.

*The real 5G NR/4G LTE data rate is dependent on local service provider.

GPS Included

The VR-300FW-NR is equipped with (global positioning system) feature. It adapts 5G-NR technology to incorporate multiple global navigation systems (GPS/GLONASS/BeiDou/Galileo/QZSS). It helps to position location of cellular gateway based on a network of satellites that continuously transmits necessary data. More signals transmitted from more satellites can triangulate its location on the ground, meaning any location can be easily tracked.

Flexible WAN interface Enables Extension of Network Deployment

The VR-300FW-NR provide both copper and fiber connectors for WAN interface. With one SFP slot, it supports fiber extension for FTTX application. It allows the administrator to flexibly choose the suitable SFP transceiver according to the transmission distance required to extend the network efficiently. The distance can be extended from 550 meters to 2 kilometers (multi-mode fiber) and 10/20/30/40/50/60/70/120 kilometers (single-mode fiber or WDM fiber). They are well suited for applications to uplink to backbone switch and monitoring center in long distance.

Wireless 11ax Brings Excellent Data Link Speed

The VR-300FW-NR is designed with high power amplifier and 2 highly-sensitive antennas which provide stronger signal and excellent coverage even in the wide-ranging or bad environment. With adjustable transmit power option, the administrator can flexibly reduce or increase the output power for various environments, thus reducing interference to achieve maximum performance. Equipped with the next-generation Wi-Fi 6 (802.11ax) wireless network standard, the total bandwidth reaches **1800Mbps**, and the 2-stream transmission technology improves the transmission efficiency of multiple devices, making AR/VR/IoT applications smoother. The IEEE 802.11ax also optimizes MU-MIMO (Multi-User MIMO) mechanism to serve multiple devices simultaneously.

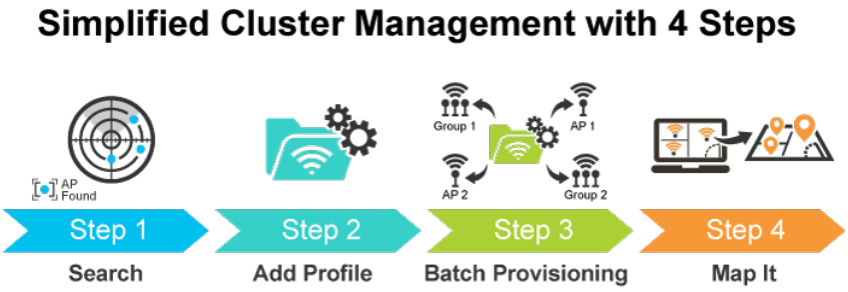
Wi-Fi Deployments and Authentication with Simplified Management

The VR-300FW-NR provides a built-in AP Controller, Captive Portal, RADIUS and a DHCP server to facilitate small and medium businesses to deploy secure employee and guest access services without any additional server. The VR-300FW-NR can offer a secure Wi-Fi network with easy installation for your business.

Centralized Remote Control of Managed APs*

The VR-300FW-NR provides centralized management of PLANET Smart AP series via a user-friendly Web GUI. It's easy to configure AP for the wireless SSID, radio band and security settings. With a four-step configuration process, different purposes of wireless profiles can be simultaneously delivered to multiple APs or AP groups to minimize deployment time, effort and cost.

For example, to configure multiple Smart APs of the same model, the VR-300FW-NR allows clustering them to a managed group for unified management. According to requirements, wireless APs can be flexibly expanded or removed from a wireless AP group at any time. The AP cluster benefits bulk provision and bulk firmware upgrade through single entry point instead of having to configure settings in each of them separately.



Ideal High-Availability VPN Security Router Solution for SMBs

The VR-300FW-NR provides complete data security and privacy for accessing and exchanging the most sensitive data, built-in IPSec VPN function with DES/3DES/AES encryption and MD5/SHA-1/SHA-256/SHA-384/SHA-512 authentication, and GRE, SSL, PPTP and L2TP server mechanism. The full VPN capability in the VR-300FW-NR makes the connection secure, more flexible, and more capable.

Excellent Ability in Threat Defense

The VR-300FW-NR with built-in SPI (stateful packet inspection) firewall and DoS/DDoS attack mitigation functions provides high efficiency and extensive protection for your network. Thus, virtual server and DMZ functions can let you set up servers in the Intranet and still provide services to the Internet users.

Cybersecurity Network Solution to Minimize Security Risks

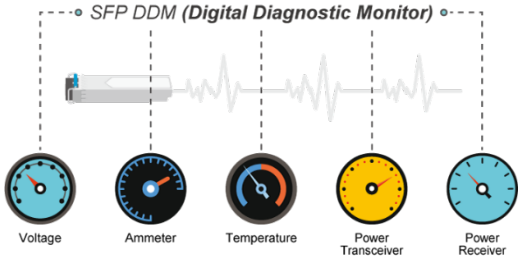
The cybersecurity feature included to protect the switch management in a mission-critical network virtually needs no effort and cost to install. For efficient management, the VR-300FW-NR is equipped with HTTPS web and SNMP management interfaces. With the built-in web-based management interface, the VR-300FW-NR offers an easy-to-use, platform independent management and configuration facility. The VR-300FW-NR supports SNMP and it can be managed via any management software based on the standard SNMP protocol.

Maximizing Work Efficiency with PLANET SD-WAN Gateway

PLANET VR-300FW-NR incorporated in SD-WAN (software-defined wide area network) function can greatly increase WAN optimization for multiple WAN links to be managed. With SD-WAN, users can connect any application across all available network connections at every site. It improves application performance and provides a high-quality user experience for increasing business productivity and reducing IT costs.

Intelligent SFP Diagnosis Mechanism

The VR-300FW-NR supports SFP-DDM (digital diagnostic monitor) function that greatly helps network administrator to easily monitor real-time parameters of the SFP, such as optical output power, optical input power, temperature, laser bias current, and transceiver supply voltage.



Common_Intelligent-SFP_SFP+-Diagnosis-Mechanism.png

2. PRODUCT FEATURES

Highlights

- Global 5G NR (NSA/SA)/4G LTE network with SIM design for cellular network redundancy
- Automatic failover between 5G NR and Gigabit WAN
- Complies with IEEE 802.11ax and IEEE 802.11a/b/g/n/ac standards
- Dual-WAN failover and dual-WAN load balancing
- One 1000BASE-X SFP slot for WAN/LAN interface
- SSL VPN and robust hybrid VPN (IPSec/PPTP/L2TP over IPSec)
- Stateful Packet Inspection (SPI) firewall and content filtering
- Blocks DoS/DDOS attack, port range forwarding
- High Availability, AP Controller, Captive Portal and RADIUS
- IPv6, SNMP, PLANET DDNS and Universal Network Management System
- Planet NMS controller system and CloudViewer app supported

Hardware

- 1 1000BASE-X SFP slot
- 5 10/100/1000BASE-T RJ45 ports, 1 undefined Ethernet port (LAN/WAN) for dual-WAN function
- 1 x SIM card slot
- 1 USB port for system configuration backup and restoration
- Reset button and fanless design
- Desktop installation or rack mounting

Cellular Interface

- Supports multi-band connectivity with 5G NR (NSA/SA), LTE-FDD, LTE-TDD, and WCDMA
- Built-in SIM and broadband backup for network redundancy
- Four detachable antennas for 5G NR connection
- LED indicators for signal strength and connection status
- Global Navigation Satellite System (GNSS)

RF Interface Characteristics

- Features 2.4GHz (802.11b/g/n/ax) and 5GHz (802.11a/n/ac/ax) dual band for carrying high load traffic
- 2T2R MIMO technology for enhanced throughput and coverage
- Provides multiple adjustable transmit power control
- High speed up to 1.8Gbps (600Mbps for 2.4GHz or 1200Mbps for 5GHz) wireless data rate

IP Routing Feature

- Static Route

- Dynamic Route
- OSPF

Firewall Security

- Cybersecurity
- Stateful Packet Inspection (SPI) firewall
- Blocks DoS/DDoS attack
- Content Filtering
- MAC Filtering and IP Filtering
- NAT ALGs (Application Layer Gateway)
- Blocks SYN/ICMP Flooding

VPN Features

- IPSec/Remote Server (Net-to-Net, Host-to-Net), GRE, PPTP Server, L2TP Server, SSL Server/Client (Open VPN)
- Max. Connection Tunnel Entries: 60 VPN tunnels,
- Encryption methods: DES, 3DES, AES, AES-128/192/256
- Authentication methods: MD5, SHA-1, SHA-256, SHA-384, SHA-512

Networking

- Outbound load balancing
- Failover for dual-WAN
- High Availability
- Captive Portal
- RADIUS Server/Client
- Static IP/PPPoE/DHCP client for WAN
- DHCP server/NTP client for LAN
- Protocols: TCP/IP, UDP, ARP, IPv4, IPv6
- Port forwarding, QoS, DMZ, IGMP, UPnP, SNMPv1,v2c, v3
- MAC address clone
- DDNS: PLANET DDNS, Easy DDNS, DynDNS and No-IP

Others

- Setup wizard
- Dashboard for real-time system overview
- SFP-DDM (Digital Diagnostic Monitor)
- Supported access by HTTP or HTTPS

- Auto reboot
- PLANET NMS System and Smart Discovery Utility for deployment management
- PLANET CloudViewer app for real-time monitoring

3. PRODUCT SPECIFICATIONS

3.1 Main Components

Main Controller	Dual-core 1.35G MHz (integrated with MT7622A)
Switch Controller	MT7531
Fiber PHY	RTL8211F
5G NR	SIMcom SIM8202G-M2 or Quectel 520N-GL
Wi-Fi	Wi-Fi 6 1800AX (Mini-PCIE 2.0)
RAM	512 MBytes
Flash	64MB

3.2 Functional Specifications

Model	**VR-300FW-NR**	
Hardware Specifications		
Ethernet	5 10/100/1000BASE-T RJ45 Ethernet ports ■ 4 LAN ports (Ports 1 to 4) ■ 1 WAN/LAN port (Port 5)	
Fiber	One 1000BASE-X SFP Gigabit Ethernet port (Port 6) Supports WAN port mode or LAN port mode over software configuration	
USB Port	1 USB 2.0 port for system configuration backup and restoration	
Reset Button	Reset to factory default	
Thermal Fan	1	
LED Indicators	System: PWR, Internet, SIM, 5G, 2.4G (Green) Ethernet Interfaces (Port 1-5): 10/100/1000 LNK/ACT (Green) Fiber Interfaces (Port 6): 1000 LNK/ACT (Green)	
Installation	Desktop installation or rack mounting	
Power Requirements	100~240V AC, 50/60Hz, auto-sensing	
Power Consumption / Dissipation	Max. 6.4 watts/21.82 BTU (No Loading) Max. 9.5 watts/32.39 BTU (Full loading)	
Weight	1508g	
Dimensions (WxDxH)	330 x 155 x 44 mm, 1U height	
Enclosure	Metal	
Multi Band Supports		
5G SUB6 BANDS	NSA	n1/n2/n3/n5/n7/n8/n12/n13/n14/n18/n20/n25/n28/n29/n30/n38/n40/n41/n48/n66/n70/n71/n75/n76/n77/n78/n79

	SA	n1/n2/n3/n5/n7/n8/n12/n13/n14/n18/n20/n25/n28/n29/n30/n38 /n40/n41/n48/n66/n70/n71/n75/n76/n77/n78/n79
LTE BANDS	FDD	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B 26/B28/B29/ B30/B32/B66/B71
	TDD	B34/B38/B39/B40/B41/B42/B43/B48
	LAA	B46
UMTS BANDS	FDD	B1/B2/B8/B4/B5/B19 MAX DL SPEED: DL3.4Gbps; UL 550 Mbps GNSS: GPS/ GLONASS/ BDS/ Galileo/ QZSS
	TDD	MAX DL SPEED DL 2.4 Gbps; UL 900 Mbps
WCDMA	B1/B2/B3/B4/B5/B8	
GNSS	GPS L1+L5 dual bands/GLONASS/BeiDou/Galileo/QZSS	
Data Transmission Throughput	2.4Gbps (DL)/500Mbps (UL) for NR 1Gbps (DL)/200Mbps (UL) for LTE 42Mbps (DL)/5.76Mbps (UL) for HSPA+	
Wireless		
Standard	IEEE 802.11a/n/ac/ax 5GHz IEEE 802.11g/b/n/ax 2.4GHz	
Band Mode	2.4G & 5G concurrent mode	
Frequency Range	2.4GHz	America FCC: 2.412~2.462GHz Europe ETSI: 2.412GHz~2.472GHz
	5GHz	5.15GHz ~5.875GHz
Operating Channels	2.4GHz	America FCC: 1~11 Europe ETSI: 1~13
	5GHz	America FCC: Non-DFS: 36, 40, 44, 48, 149,153,157,161,165 DFS: 52, 56, 60, 64, 100, 104, 108, 112, 116, 132, 136, 140 Europe ETSI: Non-DFS: 36, 40, 44, 48 DFS: 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140 5GHz channel list will vary in different countries according to their regulations.
Channel Width	20MHz, 40MHz, 80MHz	
Data Transmission Rates	Transmit: 600 Mbps* for 2.4 GHz and 1200 Mbps* for 5 GHz Receive: 600 Mbps* for 2.4 GHz and 1200 Mbps* for 5 GHz ***The estimated transmission distance is based on the theory. The actual distance will vary in different environments.**	
Transmission Power	11b: 23dbm+/- 1.5dbm @11Mbps 11g: 20dbm+/- 1.5dbm @54Mbps 11g/n: 20dBm +/- 1.5dbm @MCS7, HT20 17dBm@MCS7,HT40 11a: 19.5dBm +/- 1.5dbm @54Mbps 11a/n: 19.5dBm+/- 1.5dbm @MCS7, HT20 17dBm@MCS7, HT40	

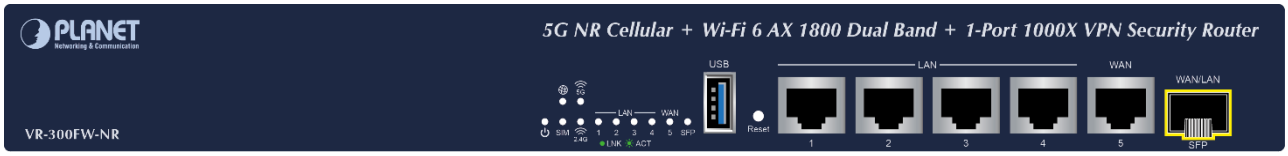
	11ac HT20: 20+/-1.5dBm @MCS8 11ac HT40: 17+/-1.5dBm @MCS9 11ac HT80: 14.5+/-1.5dBm @MCS9 11ax HT20: 20+/-1.5dBm @MCS9 11ax HT40: 17 +/- 1.5dBm @MCS9 11ax HT80: 14.5 +/- 1.5dBm @MCS11
Encryption Security	WEP (64/128-bit) encryption security WPA / WPA2 (TKIP/AES) WPA-PSK / WPA2-PSK (TKIP/AES) / WPA3-PSK (TKIP/AES) 802.1x Authenticator
Wireless Advanced	Wi-Fi Multimedia (WMM) Auto channel selection Wireless output power management MAC address filtering
Security Service	
Firewall Security	Cybersecurity Stateful Packet Inspection (SPI) Blocks DoS/DDoS attack
ALG (Application Layer Gateway)	SIP, RTSP, FTP, H.323, TFTP
NAT	Port forwarding DMZ Host UPnP
Content Filtering	MAC filtering IP filtering Web filtering
Bandwidth Management	Outbound load balancing Failover for dual-WAN QoS (Quality of Service)
Networking	
Operation Mode	Routing mode
Routing Protocol	Static Route, Dynamic Route (RIP), OSPF
VLAN	802.1q Tag-based, Port-based, Multi-VLAN
Multicast	IGMP Proxy
NAT Throughput	Max. 900Mbps
Outbound Load Balancing	Supported algorithms: Weight
Protocol	IPv4, IPv6, TCP/IP, UDP, ARP, HTTP, HTTPS, NTP, DNS, PLANET DDNS, PLANET Easy DDNS, DHCP, PPPoE, SNMPv1/v2c/v3,
Key Features	HA (High Availability) Captive Portal RADIUS Server/Client AP Control
VPN	
VPN Function	IPSec/Remote Server (Net-to-Net, Host-to-Net) GRE PPTP Server L2TP Server

	SSL Server/Client (Open VPN)
VPN Tunnels	Max. 60
VPN Throughput	Max. 108Mbps
Encryption Methods	DES, 3DES, AES or AES-128/192/256 encryption
Authentication Methods	MD5/SHA-1/SHA-256/SHA-384/SHA-512 authentication algorithm
Management	
Basic Management Interfaces	Web browser SNMP v1, v2c PLANET Smart Discovery utility/UNI-NMS supported
Secure Management Interfaces	SSHv2, TLSv1.2, SNMP v3
System Log	System Event Log
Others	Setup wizard Dashboard System status/service Statistics Connection status Auto reboot Diagnostics
Standards Conformance	
Regulatory Compliance	CE, FCC
Environment Specifications	
Operating	Temperature: 0 ~ 50 degrees C Relative Humidity: 5 ~ 95% (non-condensing)
Storage	Temperature: -10 ~ 60 degrees C Relative Humidity: 5 ~ 95% (non-condensing)

3.3 Physical Specifications

Dimensions (W x D x H)	330 x 155 x 44 mm
Net Weight	1.5 kg

Front View



■ System

LED	Color	Function
PWR	Green	Lights up when the power is on.
Internet	Green	Lights up when the router connects to internet successfully.
SIM	Green	Indicates SIM is connecting successfully
5G	Green	Lights up when 5G Wi-Fi service is enabled
2.4G	Green	Lights up when 2.4G Wi-Fi service is enabled

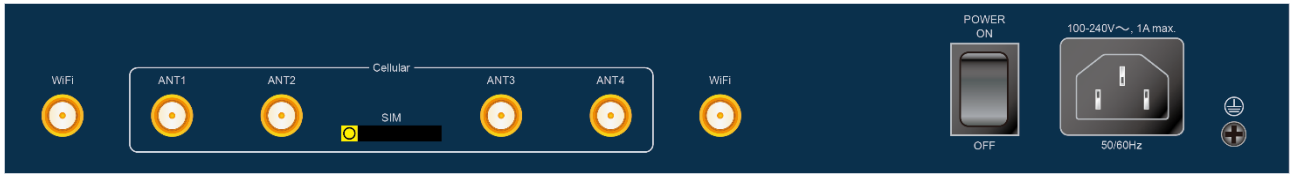
■ LAN Per 10/100/1000Mbps RJ45 Port (Ports 1 to 5)

LED	Color	Function	
LNK/ACT	Green	Lights	To indicate the port is running at 1000Mbps, 100Mbps or 10Mbps and successfully established
		Blink	To indicate that the router is actively sending or receiving data over that port.

■ 1000BASE-X SFP Port (Port 6)

LED	Color	Function	
LNK/ACT	Green	Lights	To indicate the port is running at 1000Mbps and successfully established
		Blink	To indicate that the router is actively sending or receiving data over that port.

Rear View



3.4 Environmental Specifications

Operating

Temperature	0 ~ 50°C
Relative Humidity	5 ~ 95% (non-condensing)

Storage

Temperature	-10 ~ 60°C
Relative Humidity	5~95% (non-condensing)

3.5 Power Specifications

Power Requirement	100-240V AC, 2A

Power Consumption \ Models		VR-300FW-NR	
Power Consumption (System on):	AC 110V	Watts	BTU/hr
		6.4 W	21.8
	AC 220V	6.4 W	21.8
Power Consumption (Full Loading):	AC 110V	9.5 W	31.3
	AC 220V	9.2W	32.3

3.6 Regulatory Compliance

FCC, CE

3.7 Reliability

MTBF > 50000 hrs @ 40 degrees C

3.8 Basic Packaging

- VR-300FW-NR x 1
- Quick installation guide (QR code) sheet x 1
- Power cord x 1
- Feet pads x 4
- Two rack-mounting brackets with attachment screws x 1
- 2.4G/5G dual band antenna x 2
- 5G NR antenna x 4

3.9 Packaging Information

Dimensions (W x D x H)	390 x 233 x 85 mm
Weight (gross weight)	1.9 kg
Carton Dimensions (W x D x H)	530 x 409 x 260 mm
Carton Weight (total)	TBD
Carton Unit	6pcs in one carton