

PRODUCT SPECIFICATION

YNW-6501MH

Handheld Broadband Wireless MESH Ad-Hoc Network
Equipment

Shenzhen Yuneng Micro Technology Co., Ltd.

2026.8 (V1.0)

Model YNW-6501MH

Handheld

Product Name Handheld Broadband Wireless MESH Ad-Hoc Network Equipment

Series YNW-6500 Series MESH Ad-Hoc Network Equipment

Core Technology COFDM + MESH Multi-hop Ad-Hoc Network + 64-node Ad-Hoc Networking + GPS/BeiDou

1. Product Overview

Product Positioning: The YNW-6501MH is a compact, high-throughput single-soldier handheld wireless Ad-Hoc communications device based on COFDM technology and MESH multi-hop Ad-Hoc networking. It supports automatic networking and automatic computation of intra-network routes without manual intervention, supporting 64-node Ad-Hoc networking and multi-hop transmission for seamless area coverage — the ideal choice for single-soldier tactical communications, emergency command, and counter-terrorism and emergency response scenarios.

The YNW-6501MH (handheld) broadband wireless MESH Ad-Hoc product is a newly launched, compact, high-throughput wireless broadband MESH device from our company. Developed on COFDM technology and MESH multi-hop Ad-Hoc networking, it achieves free-form networking among different device form factors, enabling users to rapidly build reliable wireless links in complex environments and providing fast, flexible solutions for various application requirements (e.g., HD video, voice intercom, and IP data transmission). As a broadband Ad-Hoc radio forming a centerless, Ad-Hoc, self-adaptive, self-healing Mesh network, it is the optimal choice for point-to-point, point-to-multipoint, or multipoint-to-multipoint integrated-services communications. The Mesh radio delivers dynamic routing, multi-hop relay of HD video, multi-channel data, and high-fidelity voice between different nodes within the same network under complex conditions such as fast movement, non-line-of-sight (NLOS) obstruction, and environmental interference.

This product adopts an all-IP design with flexible installation and convenient operation and maintenance. It offers customizable frequency bands and extensible features such as WiFi, GPS, and 3G/4G to support integrated communications requirements. The handheld design provides 0.1-2W adjustable transmit power, with a point-to-point throughput peak of up to 60Mbps and a point-to-point transmission distance of over 5km (line of sight). It supports 64-node Ad-Hoc networking and automatic multi-hop transmission (>8 hops) for seamless area coverage. It is power-on-and-use with no configuration required, supports configuration via mobile phone and Web, and can be managed remotely. It is flexibly applied to military communications private networks, public-security private networks, emergency communications private networks, industry information private networks, regional broadband private networks, wireless surveillance private networks, collaborative management private networks, and intelligent transmission private networks.

- **Core Selling Points:** Multi-carrier COFDM technology; point-to-point throughput peak of 60Mbps; point-to-point transmission distance of over 5km; supports 64-node Ad-Hoc networking with automatic multi-hop transmission for seamless area coverage
- **Target Users:** Single-soldier tactical communications users in the military, armed police, fire services, public security, and emergency communications
- **Typical Applications:** Complex environments such as military communications, counter-terrorism and emergency response, armed patrol, firefighting and rescue, military drills, emergency handling, covert reconnaissance, and special operations

Design Highlights: Handheld single-soldier design, weighing only 1.05kg, dimensions 210×80×45mm, IP65 protection rating. Supports 0.1-2W adjustable transmit power, operating frequency band 225MHz-1.5GHz customizable, signal bandwidth 5/10/20MHz adjustable, power-on-and-use with no configuration, and remote management.

2. Product Views



YNW-6501MH Front View



YNW-6501MH Side View

3. Key Features

 Multi-carrier COFDM Technology Multi-carrier COFDM modulation effectively suppresses multipath interference, maintaining stable communications in obstructed, non-line-of-sight environments	 High-throughput Point-to-point throughput peak of up to 60Mbps, supporting concurrent HD video, multi-channel data, and voice	 Long-range Transmission Point-to-point transmission distance of over 5km (line of sight), meeting single-soldier tactical communications needs
 Automatic Networking Automatic networking and automatic computation of intra-network routes without manual intervention, effectively saving manpower and resources	 64-node Ad-Hoc Supports 64-node Ad-Hoc networking with >8 hops, automatic multi-hop transmission for seamless area coverage	 Power-on-and-use Ready to use upon power-on, no configuration; joins the network 8s after system startup for rapid dedicated broadband Ad-Hoc network setup
 Remote Management Supports configuration via mobile phone and Web, enabling remote management of the device	 Adjustable Power Transmit power 0.1-2W adjustable to suit different distance and scenario requirements	 Customizable Wide Frequency Band Operating frequency band 225MHz-1.5GHz customizable to suit different industry private-network requirements
 IP65 Protection IP65 protection rating for tactical operations in harsh environments	 GPS/BeiDou Positioning Supports GPS/BeiDou positioning and WiFi; soldier	 One-key Upgrade Supports one-key upgrade and remote upgrade for convenient

locations viewed in real time via
the management platform

system maintenance and feature
expansion

4. Technical Specifications

4.1 Wireless Characteristics

Category	Parameter	Specification	Custom Option
Wireless Characteristics	Frequency Range	1438±10MHz / 580±10MHz	225MHz ~ 1.5GHz customizable
	Bandwidth	5 / 10 / 20MHz adjustable	—
	Modulation	COFDM	—
	Constellation Modulation	BPSK / QPSK / 16QAM / 64QAM (adaptive)	—
	Data Rate	Peak 60Mbps @ 20MHz	—
	Digital Sensitivity	-92dBm @ 5MHz	—
	Transmission Distance	>5km (line of sight)	—
	Transmit Power	Maximum 2000mW (0.1-2W adjustable)	—

4.2 Networking Functions

Category	Parameter	Specification	Custom Option
Networking Functions	Networking Capability	Supports 64 nodes	—
	Networking Hops	>8	—
	Network Join Time	Joins the network 8s after system startup	—
	Network Topology	Centerless network, star network, chain network, mesh network, etc.	—
	Layer-2 Transparent Relay	Supports network transparent relay function	—

4.3 System Functions

Category	Parameter	Specification	Custom Option
System Functions	Peripheral Interfaces	Network port, headset	—
	Video Input	Supports IP video input	—
	Control Functions	Supports network management system platform	—
	System Upgrade	Supports one-key upgrade and remote upgrade	—
	Other Functions	GPS/BeiDou, WiFi	—

4.4 Physical Characteristics

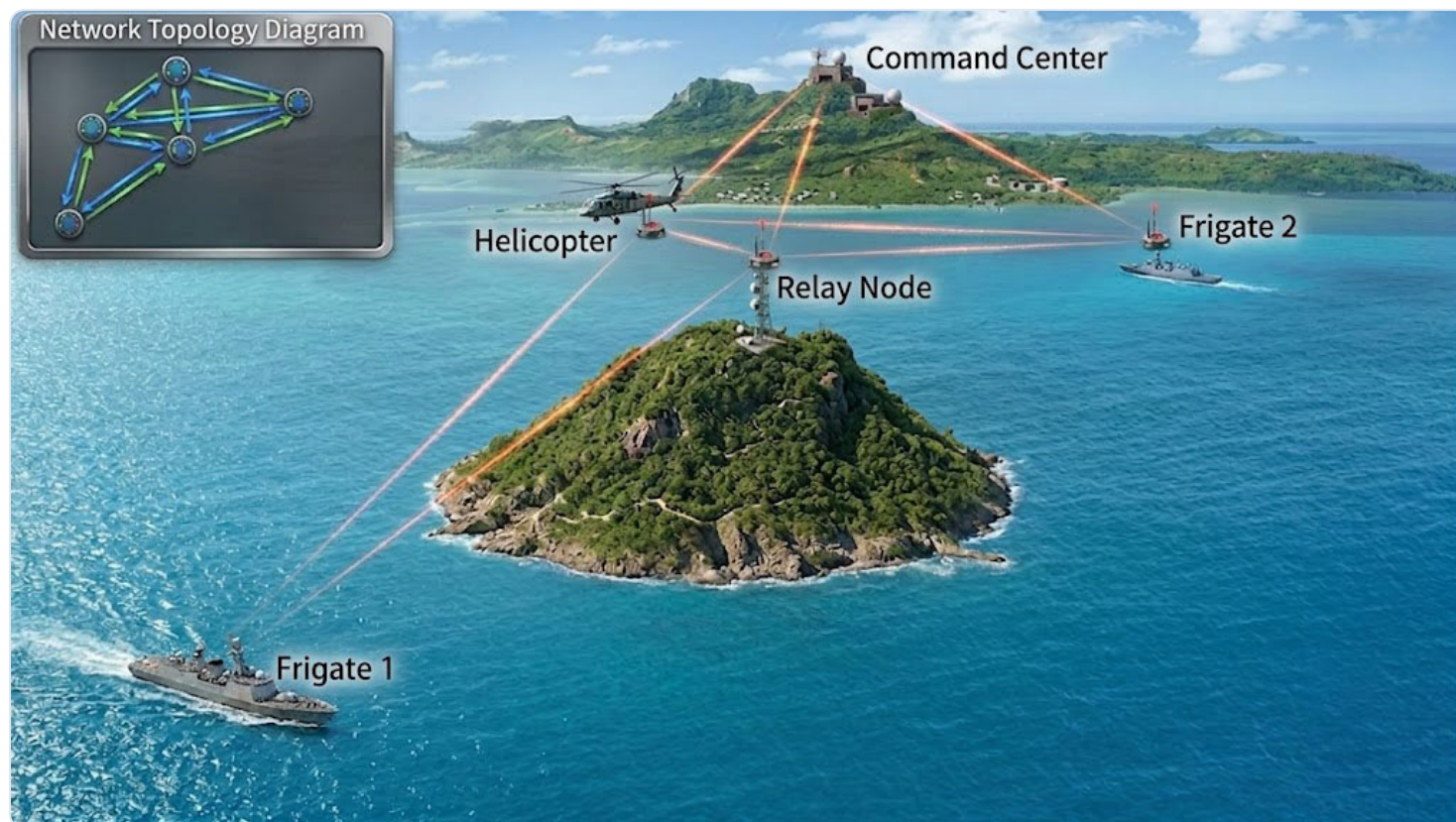
Category	Parameter	Specification	Custom Option
Physical Characteristics	Power Consumption	≤24W (1W)	—
	Operating Temperature	-20°C ~ 55°C	—
	Protection Rating	IP65	—
	Dimensions	210 × 80 × 45mm	—
	Total Weight	1.05kg	—
	Power Supply	Built-in battery	—

Customization Note: This product supports a variety of customization options including frequency band, output power, and number of nodes. For details, please contact Shenzhen Yuneng Micro Technology Co., Ltd.

5. Applications

With its MESH Ad-Hoc technology, this product can be flexibly applied to military communications private networks, public-security private networks, emergency communications private networks, industry information private networks, regional broadband private networks, wireless surveillance private networks, collaborative management private networks, and intelligent transmission private networks. It provides stable, reliable, timely, and efficient HD video, multi-channel data, clear voice, and visualized command-and-dispatch services for military communications, counter-terrorism and emergency response, public-security law enforcement, security operations, rescue and disaster relief, firefighting command, forest fire prevention, forest-area monitoring, civil defense / earthquake response, power-line patrol, digital oilfield, UAV swarms, fleet interoperability, vessel formations, maritime communications, airport ground handling, metro emergency, highway construction, hydrological monitoring, mobile live broadcasting, and medical sectors.

1. Border & Coastal Defense MESH Ad-Hoc Wireless Communications



Application Scenario

Border patrol, coastal surveillance, border port control, coastline warning, border outpost interconnection, and maritime law-enforcement vessel formations — long-range, wide-coverage border and coastal defense communications. National borderlines and coastlines are extensive with complex, varied terrain including mountains, deserts (gobi), jungles, and islands where conventional public networks often fail to provide full coverage, making dedicated broadband communications essential for border and coastal defense command and dispatch.

Deployment Solution

- **Single-soldier patrol extension:** The YNW-6501MH handheld device is carried by border patrol soldiers and freely networks with fixed border-outpost radios and patrol-boat ship-borne radios, with point-to-point transmission distance of over 5km, achieving integrated "shore-sea-soldier" coverage.
- **Multi-form-factor node convergence:** Fixed border-outpost deployment, patrol-boat ship-borne deployment, mobile command-vehicle deployment, and single-soldier handheld deployment freely self-organize, supporting 64-node Ad-Hoc networking with >8 hops for seamless area coverage.
- **GPS/BeiDou positioning:** Body-worn devices support GPS/BeiDou positioning; the network management platform displays patrol soldiers' geographic locations in real time, allowing the command center to track patrol dynamics.

Application Value

HD video, voice intercom, and situational-awareness data are backhauled between border outposts, patrol boats, and single-soldier patrol teams, keeping the command link active even in remote areas without public

network coverage. The command center can grasp border dynamics, maritime situational awareness, and soldier positions in real time, effectively enhancing border/coastal situational awareness, rapid response, and coordinated operations, providing reliable communications support for border and coastal control.

2. Convoy MESH Ad-Hoc Wireless Communications



Application Scenario

Convoy formation marching, military escort and transport, material transportation, VIP convoy security, long-distance passenger-fleet management, logistics fleet coordination, and railway engineering-vehicle group communications — mobile scenarios. As inter-vehicle distances constantly change and road conditions are complex, conventional communications cannot guarantee stable real-time links between convoy members.

Deployment Solution

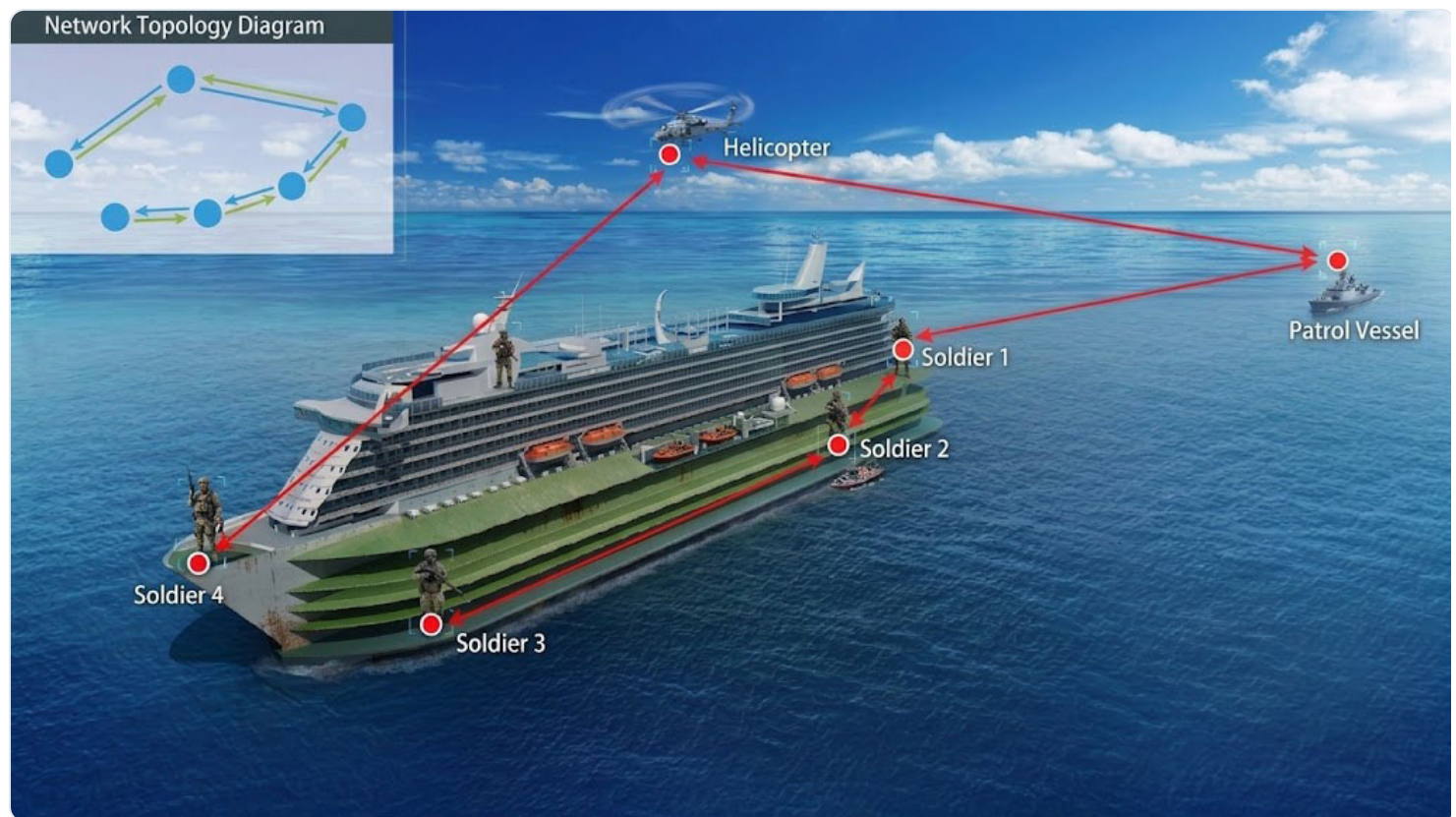
- **Vehicle-single-soldier coordination:** A vehicle-mounted MESH device is deployed on each vehicle, and accompanying personnel carry the YNW-6501MH handheld device; links between vehicles and between vehicles and soldiers are established automatically over MESH Ad-Hoc networking without relying on fixed base stations or public networks.
- **Dynamic route convergence:** Under high-speed movement, changing inter-vehicle distances, road masking, and tunnel transit, the network automatically networks and computes intra-network routes, reconfiguring the topology without manual intervention.
- **Concurrent multi-service:** Supports concurrent onboard HD video backhaul, voice intercom, vehicle position sharing, and command-instruction issuance, with a point-to-point throughput peak of up to 60Mbps.
- **Layer-2 transparent relay:** Supports network transparent relay function to interconnect the convoy private network with the rear command center, enabling integrated front-rear command.

Application Value

While convoys are in motion, HD video, voice intercom, and location information are shared in real time between vehicles and between vehicles and soldiers, and the command vehicle can grasp the full fleet situation

for integrated formation command and coordinated dispatch. In counter-terrorism/stability maintenance, armed escort, and military material transport missions, it provides a public-network-independent, secure channel for the fleet, significantly improving fleet mobile command capability and mission security.

3. Vessel-boarding Reconnaissance MESH Ad-Hoc Wireless Communications



Application Scenario

Maritime boarding inspection, surveillance and evidence collection, cross-ship coordinated operations, fleet formation communications, maritime law-enforcement boarding, coast guard patrols, and naval tactical coordination. The maritime environment presents unique challenges including wave-induced motion, severe multipath interference, and constantly changing relative positions between vessels, which conventional communications cannot reliably overcome.

Deployment Solution

- **Boarding-team extension:** The boarding-inspection team is equipped with the YNW-6501MH handheld device, maintaining real-time communication with the mother vessel and formation vessels, backhauling onboard HD video and voice to the mother vessel's command center in real time.
- **Vessel-to-vessel coordinated networking:** MESH devices are deployed on multiple vessels; broadband MESH Ad-Hoc links form automatically between vessels to support formation coordination and integrated communications.
- **Multipath-interference resilience:** COFDM multi-carrier modulation effectively suppresses maritime multipath reflections, maintaining link stability under wave-induced motion and vessel sway in high-dynamic environments.
- **Fast route convergence:** Automatic networking and automatic computation of intra-network routes ensure the network topology auto-adjusts as vessel relative positions change, without communication interruption.

Application Value

During boarding inspections, surveillance/evidence collection, and cross-ship coordination, stable maritime broadband Ad-Hoc links are established between the boarding team and vessels, backhauling HD video and voice in real time and providing reliable communications support for maritime law enforcement, search and rescue, and tactical coordination. Commanders can grasp the boarding-site situation in real time and make remote decisions, significantly improving maritime enforcement safety and tactical coordination efficiency.

4. Public Security Disposal & Armed Patrol MESH Ad-Hoc Wireless Communications



Application Scenario

Major event security (conferences, competitions, performances), temporary interception and arrest operations, armed patrols, counter-terrorism and emergency response, mass-incident disposal, VIP protection, checkpoint enforcement, and special-duty missions. Such public-safety scenarios impose extremely high requirements on rapid deployment, temporary private networks, multi-channel video backhaul, and resilience against public-network congestion.

Deployment Solution

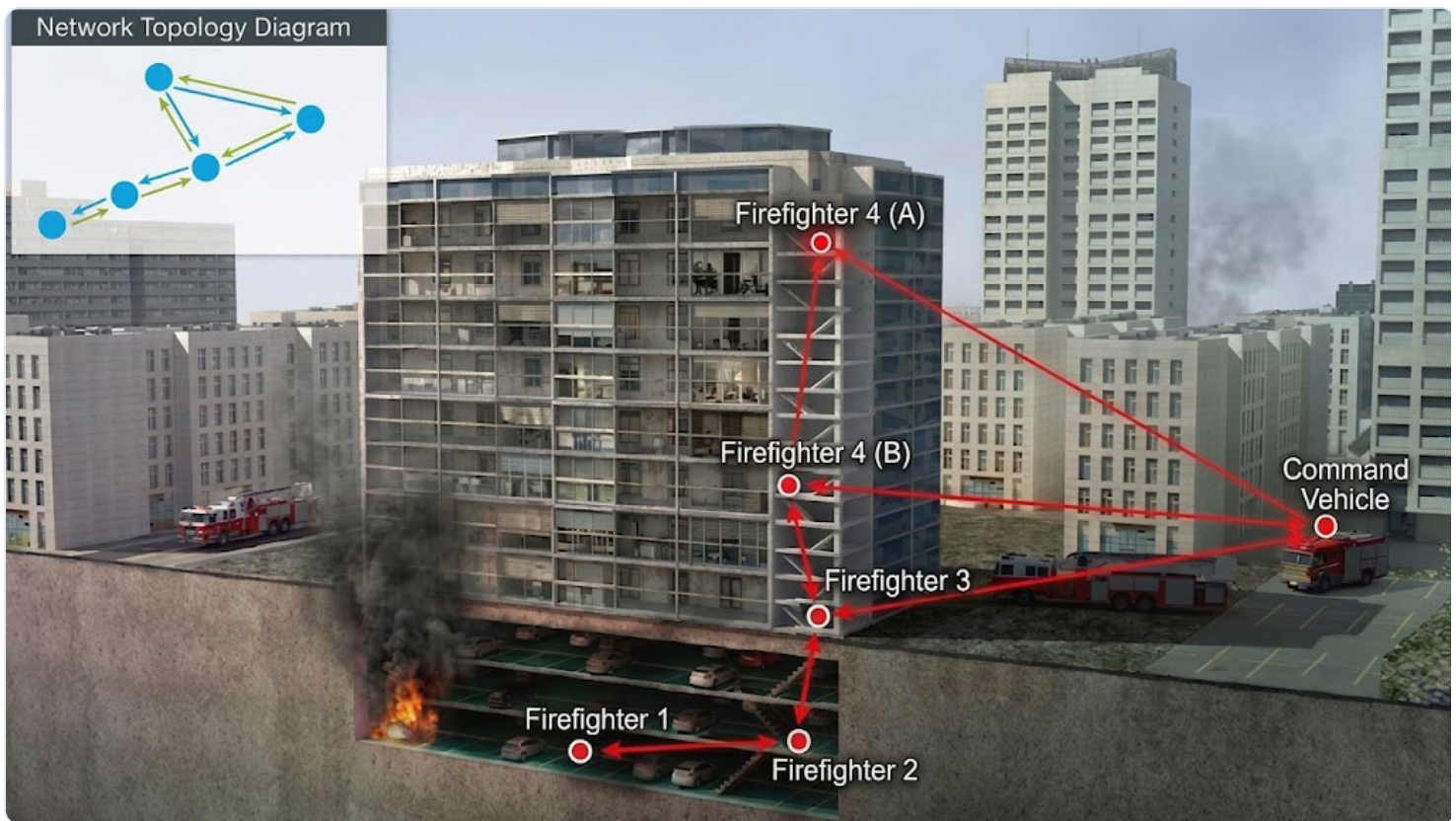
- **Rapid single-soldier deployment:** The YNW-6501MH is power-on-and-use with no configuration, joining the network 8s after system startup, enabling a dedicated broadband communications network to be built on-site within 5 minutes, completely independent of the public network.
- **Multi-terminal integrated access:** Single-soldier law-enforcement cameras, vehicle terminals, temporary surveillance domes, and UAV aerial relays converge through the MESH Ad-Hoc network, with multiple video streams backhauled to the command center in real time.
- **Centerless architecture:** The centerless Ad-Hoc architecture does not rely on public-network base stations, maintaining communications even under network congestion or public-network outage (e.g., congestion caused by large crowds at major events).
- **Layer-2 transparent relay:** Supports network transparent relay function to interconnect the on-site private network with the public-security command center in areas with public coverage, enabling integrated front-rear command.
- **GPS/BeiDou positioning:** The network management platform displays soldier positions in real time, allowing the command center to track all personnel.

- **Remote management:** Supports configuration via mobile phone and Web, enabling remote device management for convenient maintenance.

Application Value

Provides the public-security command with real-time on-site situational awareness during major event security, temporary disposal, and armed patrol operations, with stable backhaul of multi-channel HD video, voice intercom, and data. The centerless architecture ensures uninterrupted communications even under extreme conditions such as public-network outage or congestion, providing reliable communications support for counter-terrorism/emergency response and enhancing rapid response and coordinated operations.

5. Firefighting & Rescue MESH Ad-Hoc Wireless Communications



Application Scenario

Fire suppression (building, forest, and chemical fires), earthquake rescue, accident emergency response, hazardous-material leakage incidents, traffic-accident rescue, and building-collapse rescue. On-site public networks are often interrupted or severely congested during disasters, necessitating dedicated communications for rescue command.

Deployment Solution

- **Single-soldier deep-entry into fire scene:** Firefighters carry the YNW-6501MH handheld device into the fire scene, backhauling interior HD video to the on-site command vehicle and rear command center via multi-hop relay, establishing a "soldier-vehicle-command" three-tier network.
- **Rapid private network setup:** The YNW-6501MH is power-on-and-use, joining the network 8s after system startup, building a dedicated broadband Ad-Hoc network among firefighters, command vehicles, and temporary command points within 5 minutes, without any infrastructure.
- **Concurrent multi-stream video:** Supports IP video input and concurrent backhaul of multiple HD video streams; the command center can simultaneously view live pictures of multiple fire points and rescue teams to fully grasp the on-site situation.
- **Self-healing / damage resilience:** When a node device is damaged or moves, the network automatically reconfigures, and remaining nodes re-establish routing without communication interruption, sustaining rescue continuity.
- **IP65 protection:** IP65 protection rating adapts to harsh fire-scene conditions such as high temperature, smoke, and water mist, ensuring stable device operation.

Application Value

Enables the rear command center to grasp the full on-site picture, scientifically dispatch rescue forces, and improve rescue efficiency and safety. Firefighters can receive command instructions in real time, backhaul on-site video, and hold voice intercom with the command center, avoiding blind operations and maximizing firefighter safety and rescue outcomes. Provides reliable communications support within the "golden 72-hour rescue window," buying critical time for life-saving operations.

6. Natural-disaster Emergency Command MESH Ad-Hoc Wireless Communications



Application Scenario

Emergency command communications for sudden natural disasters — earthquakes (especially magnitude 7+), floods (peak-flow transit, dam breaches, urban waterlogging), debris flows, landslides, typhoons, snowstorms, and freezing rain. Such disasters commonly destroy extensive communications infrastructure and fully disrupt public networks, leaving emergency command in an "information island" dilemma.

Deployment Solution

- **Carried into disaster area:** Rescue teams carry the YNW-6501MH handheld device into affected areas, rapidly erecting temporary communication nodes and using multi-hop relays for wide-area coverage that overcomes terrain blocking.
- **Air-ground integrated networking:** Combined with UAV aerial relay platforms, an "air-ground" three-dimensional Ad-Hoc network overcomes complex terrain such as mountains and ruins for whole-disaster-area coverage.
- **Multi-hop relay wide coverage:** Supports multi-hop relay with >8 hops and point-to-point transmission distance of over 5km; multi-hop cascading achieves wide-area coverage of tens of kilometers to meet large-area disaster communications needs.
- **Self-healing / damage resilience:** Self-healing ensures automatic network reconfiguration as nodes move, equipment is damaged, or new nodes join, with no manual intervention, providing sustained and reliable communications support for emergency command.
- **GPS/BeiDou positioning:** The network management platform displays rescue-team locations in real time, allowing the command center to track all personnel and optimize rescue routes.

- **Layer-2 transparent relay:** In areas with partial public coverage, network transparent relay interconnects the disaster-area private network with the rear command center for integrated front-rear command.

Application Value

Provides stable, reliable communications support for emergency command and dispatch during sudden natural disasters, backhauling on-site video, disaster data, and rescue-team positions to front-line and rear commands in real time. The command center fully grasps the disaster situation, scientifically dispatches rescue forces, optimizes rescue routes, and improves rescue efficiency. Provides communications support for life-saving within the "golden 72-hour rescue window," minimizing casualties and property loss.

7. Forest Fire Prevention MESH Ad-Hoc Wireless Communications



Application Scenario

Forest fire monitoring, forest-area patrol communications, watchtower interconnection, fire frontline command, fire-scene situational backhaul, forest-area wildlife protection, and forest-area public-order control. China's extensive forest resources are mostly in mountainous and remote areas with weak public coverage, so forest-fire communications have long faced high-cost coverage and networking challenges.

Deployment Solution

- **Single-soldier patrol networking:** Patrol personnel carry the YNW-6501MH handheld device into forest areas, freely networking with watchtower fixed radios and patrol UAVs to build a broadband Ad-Hoc private network covering vast forest areas.
- **Multi-hop relay overcoming terrain:** Multi-hop relays overcome forest-line-of-sight blocking and terrain undulation for wide-area coverage in hills, mountains, and canyons, with >8 hops and point-to-point transmission distance of over 5km.
- **Watchtower-UAV-soldier coordination:** Fixed watchtower monitoring, patrol UAV aerial inspection, and on-site firefighting personnel form a three-position coordinated network, backhauling video and alarms to the fire-prevention command center in real time.
- **Automatic fire alarm:** Interfaces with smoke detectors and infrared thermal-imaging fire-monitoring devices; automatic fire alarms are backhauled to the command center over the MESH network for early detection, early reporting, and early response.

Application Value

Builds an integrated air-ground broadband Ad-Hoc private network across vast forest areas, backhauling video and alarm information from watchtowers, patrol UAVs, and fire frontlines to the command center in real time for early detection, reporting, and response. During an active fire, it provides reliable communications support for frontline command, improving coordinated suppression efficiency and firefighter safety assurance, and providing solid communications support for forest-resource protection and ecological security.

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