Swarm Mesh Wireless Client

USR-FQ610

USR-FR610 is a self-organizing ad-hoc network of autonomous mobile devices that can communicate among 1024 devices without a central controller.

It supports automatic relay, rapid networking, and can switch between serial and network communication while operating in wireless swarm networks.

The product follows industrial standards with wide temperature and pressure range, offering hardware protection. It features 1 * RS232 / 1 * RS485 / 1 * Ethernet ports, supporting TCP, UDP transmission protocols. It includes built-in hardware and software double watchdogs for fault self-recovery.

The product utilizes a fixed-hole installation method commonly employed in scenarios requiring wireless centralized large connections and low latency, such as swarm UAVs, unmanned systems, data chains, individual equipment, fire IoT, power meter reading, intelligent transportation, and other related fields.

Product Characteristics

Stable and Reliable

Industrial metal shell design with protection grade IP30;

The temperature range of -25°C to +75°C, featuring high-grade hardware protection.

Wide voltage input of DC 9-24V input, with reverse power supply protection;

Built-in hardware watchdog, fault detection, self-repair, and firmware backup features to enhance system stability and prevent crashes.

Flexible networking

Support physical layer relay networking, any node leaving or joining won't affect the entire network;

High-speed synchronization and signal processing, the ad hoc network nodes can move quickly in the network;

The network topology between the terminals can be arbitrarily changed, can freely deform, fold and reconstruct;

Support Stereoscopic networking, to achieve the ground and underground communication;

Networking upon power on, support 16 jump, expand communication distance 16 times, can carry 1024 devices;

Single-jump communication distance 1-3 km, the max rate 740 kbps. The more nodes, the better signal coverage.

Powerful

RS232 \ RS485 \ Ethernet port and swarm wireless network conversion;

Serial port broadcast mode, network port broadcast mode, wireless serial server mode, wireless switch mode;

Work mode of TCPC \ TCPS \ UDPC \ UDPS, DHCP, STATIC;

Custom key, total user control, device ID, group definition;

Enables adjusting network hops, relay function, frequency modulation, and transmission power.

Product size (mm)
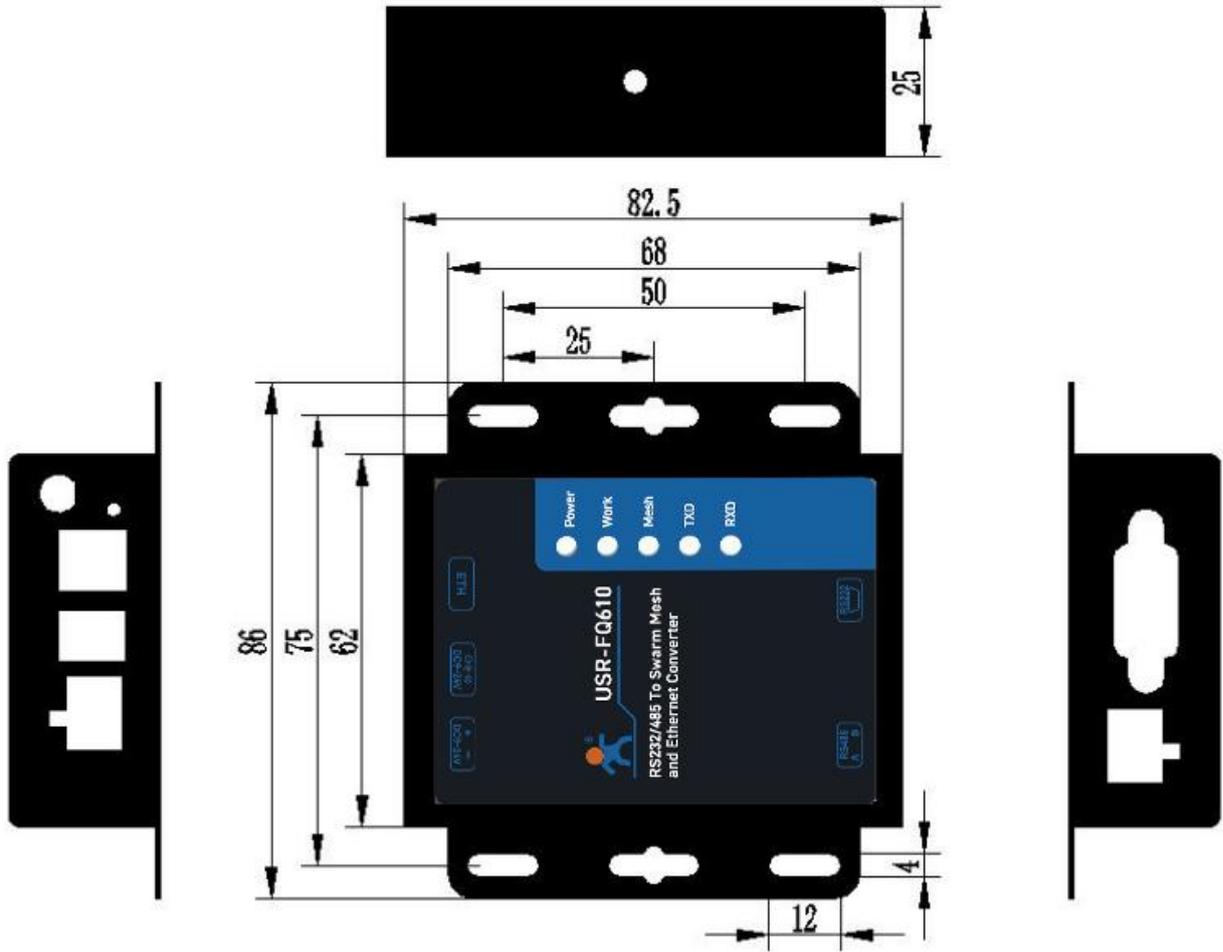
Traditional application scenarios

Complex environmental communication

Factors such as limited resources and complex building structures restrict large buildings, multi-story basements, tunnels, and mines. Ground signals cannot be directly transmitted underground. The swarm mesh (ad hoc) network technology automatically relays wireless networking through portable terminals and introduces signals downward through multi-hop forwarding to quickly achieve ground and underground interoperability.
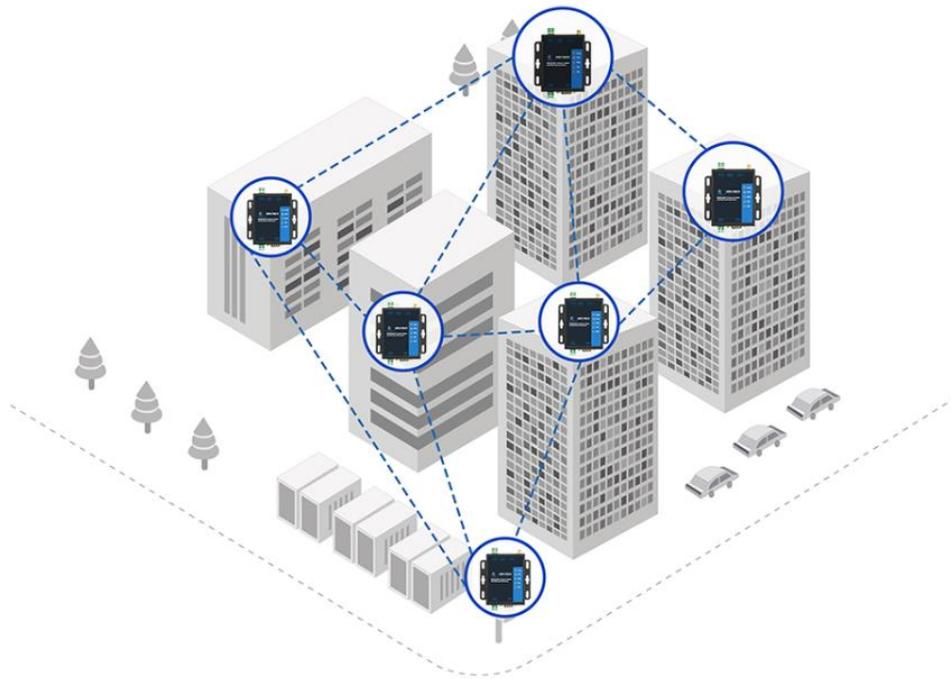

Urban Infrastructure Monitoring

Swarm Mesh is a decentralized ad hoc network technology where each node can act as a relay, ensuring that the communication of the entire network remains unaffected by nodes joining or leaving. This technology is ideal for supporting a large number of access devices and enabling fast data transmission. It finds applications in urban infrastructure monitoring for critical systems such as drainage, water supply, gas, heating, as well as in monitoring structures like bridges, tunnels, and integrated pipe corridors.
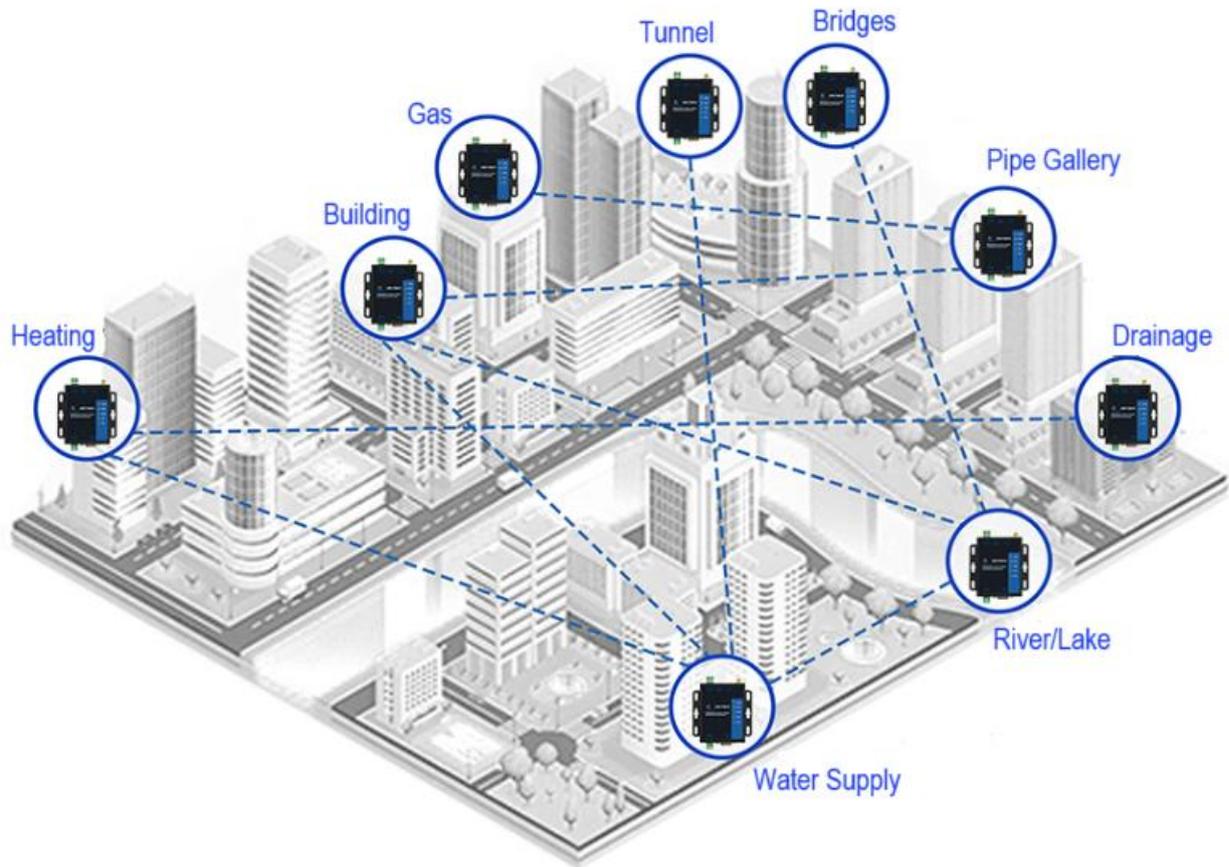
The Swarm Drone System

The Swarm Ad hoc network technology enables large-scale inter-node communication across multiple decentralized networks, allowing each node to autonomously communicate with one another. This technology addresses key technical challenges such as managing dense channel access, wireless transmission, dynamic networking, flexible reconfiguration, and real-time collaboration within unmanned clusters
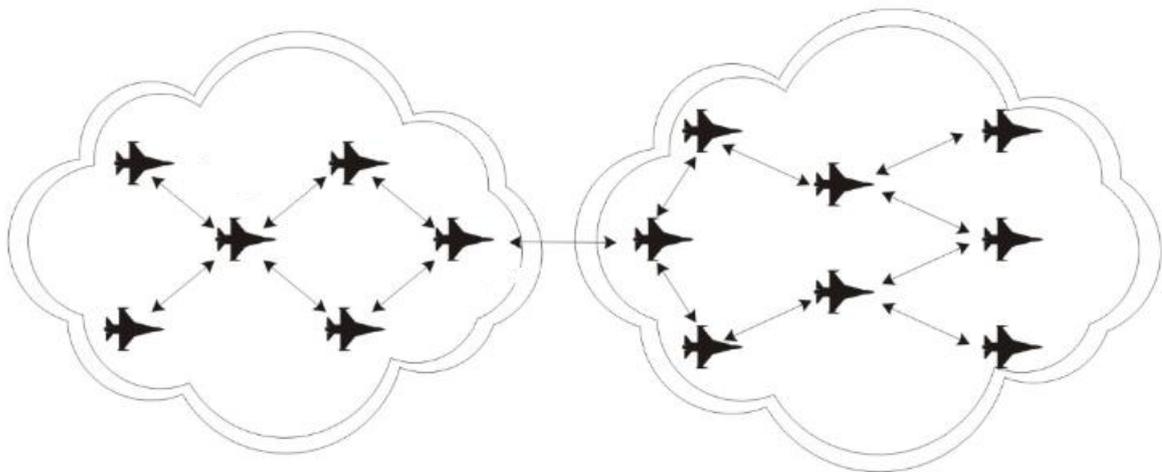
Hardware Specifications

ITEM		Specification
Wireless parameters	Work frequency band	825~850MHz，902~928MHz
	RF bandwidth	125/200/500KHz/1MHz
	Speed	740kbps
	Support the number of jumps	16
	Networking capacity	1024
	Build network time	1S
	transmitting power	10-27dbm
	Single jump communication distance	1-3 Kilometers
DTU	SOCKET pattern	TCPS/TCPC/UDPS/UDPC
	Serial port port rate	600/1200/2400/4800/9600/14400/19200/28800/38400/43000/57600/76800/115200/128000/25600
	data bit	7，8
	stop bit	1，2
	check bit	NONE,ODD,EVEN，MARK，DPACE
	Serial port type	1*RS232/1*RS485
physical characteristics	working temperature	-25℃～ +75℃
	Storage temperature	-40℃～+125℃
	Working humidity	5% ~ 95% RH (no condensation)
	Store humidity	1% ~ 95% RH (no condensation)
	service voltage	DC 9-24V
	Size	84.0 x 84.0 x 25.0（mm）(L*W*H)
	Way to install	Fixed hole installation
	EMC grade	Level 2
hardware interface	Ethernet Port	RJ45 interface: 10 / 100Mbps adaptive
	The Wi-Fi antenna interface	Standard SMA-K interface (outer screw inner hole)
	pilot lamp	PWR、WORK、Mesh、TXD 、RXD

	Power interface	2P terminal
	Terminal interface	RS232 interface: DB9 RS485 interface: 2P terminal
	Reload key	Press and hold the button to power on 1S and then release to restore the factory setting

Status indicator light

Name	Explanation
PWR	Always light on after power on
WORK	Network port Broadcast mode: 300ms frequency flash (300ms bright, 300ms out) Serial broadcast mode: 1000ms interval slow flash (1000ms on, 1000ms out) Wireless serial server mode: 1300ms out, 200ms bright Wireless switch mode: 1300ms on, 200ms out
Mesh	Flashes when there is data communication;
TXD	Flashes when there is data communication;
RXD	Flashes when there is data communication;