Mini Wireless Mesh Network XK-M501E

1. Product Introduction

The XK-M501E is a compact wireless mesh module with integrated RF power amplifier, designed for UAV systems to support high-performance mesh networks without a central hub. It features multiple interface options (SBUS, RS232, TTL) and a user-friendly design. This versatile module can be mounted on various UAV models as an onboard station, used in light-load drones, or embedded in remote controllers and other programmable devices.

2. Product Features

- ✧ Flexible networking: Supports self-organizing networks without a central hub, with flexible carrier bandwidth allocation. It can build various network topologies such as point-to-multipoint, chain relay, mesh, and hybrid, to meet complex and changing communication requirements.
- ✧ Full IP interconnection: Featuring a fully IP-based architecture, it enables seamless data transmission across all protocols, facilitates interoperability with heterogeneous communication systems, and enhances multi-network service integration to achieve broader coverage.
- ✧ Anti-jamming capability: The optional wideband carrier frequency hopping technology significantly enhances anti-jamming performance. The intelligent frequency selection mode avoids interference points in real time to ensure network stability. Combined with ARQ error control transmission mechanism, it effectively reduces data loss rate and ensures reliable data transmission.
- ✧ High reliability: The innovative integrated design of power amplifier and core board has excellent anti-vibration protection performance to ensure stable operation of the equipment in harsh environments.
- ✧ Specialized UAV waveforms (optional): Optional specialized waveforms developed specifically for UAV application scenarios to optimize transmission delay and ensure priority transmission of flight control data to improve UAV control efficiency.
- ✧ Custom development: Support customized development according to the customer's specific working frequency band to meet personalized needs.

✧ Efficient maintenance: Built-in dynamic routing mechanism with high efficiency, eliminating complex system configuration. The intuitive human-machine interface enables real-time monitoring and management, while supporting remote software upgrades, configurations, and hot restarts, significantly improving maintenance efficiency.

3. Use Cases

* Emergency Communications, Emergency Rescue Command, and MESH Self-organizing Network

* Optical-electronic smart city/outdoor power, surveying/airborne ship transmission

* City Patrol Network Construction / Emergency Communications Vehicle / UAV Video and Data Transmission

4. Product Specifications

<table>
<tr><th>classify</th><th>function</th><th colspan="4">description</th></tr>
<tr><td rowspan="14">Essential parameter</td><td>Frequency Bands</td><td colspan="4">Bands from 350MHz to 6GHz Available</td></tr>
<tr><td colspan="5">Frequency Band Options</td></tr>
<tr><td>Band(Freq. Code)</td><td>Frequency Range(MHz)</td><td>Band (Freq. Code)</td><td colspan="2">Frequency Range(MHz)</td></tr>
<tr><td>UHF</td><td>350-650</td><td>S Band</td><td colspan="2">1800-2500</td></tr>
<tr><td>L Band</td><td>1000-1500</td><td>Lower C Band</td><td colspan="2">4400-5000</td></tr>
<tr><td>MIIT</td><td>336-344/450-550/512-582/566-626/606-678/580-700/600-800/1420-1520/1430-1444</td><td>Upper C Band</td><td colspan="2">5100-6000</td></tr>
<tr><td>Transmitting power</td><td colspan="4">0.5W*2</td></tr>
<tr><td>Carrier bandwidth</td><td colspan="4">1.25/2.5/5/10/20MHz (Adjustable)</td></tr>
<tr><td>Modulation mode</td><td colspan="4">BPSK/QPSK/16QAM/64QAM/256QAM (adaptive)</td></tr>
<tr><td>Receiving sensitivity</td><td colspan="4">-103dBm@5MHz</td></tr>
<tr><td>Transmission speed</td><td colspan="4">50Mbps@20MHz</td></tr>
<tr><td>Network size</td><td colspan="4">The same-frequency networking supports 64 nodes, video encoding, and other extensions.</td></tr>
<tr><td>Transmission distance</td><td colspan="4">30-50KM</td></tr>
<tr><td rowspan="5">Device interface</td><td>Antenna interface</td><td colspan="4">MESH MMCX type ×2</td></tr>
<tr><td>Internet access</td><td colspan="4">Network port ×1</td></tr>
<tr><td>Functional interface</td><td colspan="4">ETH×1,SBUS×1,RS232×2,TTL×1</td></tr>
<tr><td>Power supply port</td><td colspan="4">1 DC 12-24V power socket (24V/2A or higher)</td></tr>
<tr><td>Pilot lamp</td><td colspan="4">Link indicator light ×1, signal indicator light ×1, 10M network port indicator light ×1, 100M network port indicator light ×1, power indicator light ×1</td></tr>
<tr><td rowspan="2">Physical index</td><td>Network power consumption</td><td colspan="4">≤5W</td></tr>
<tr><td>Peak Power</td><td colspan="4">≤9.5W</td></tr>
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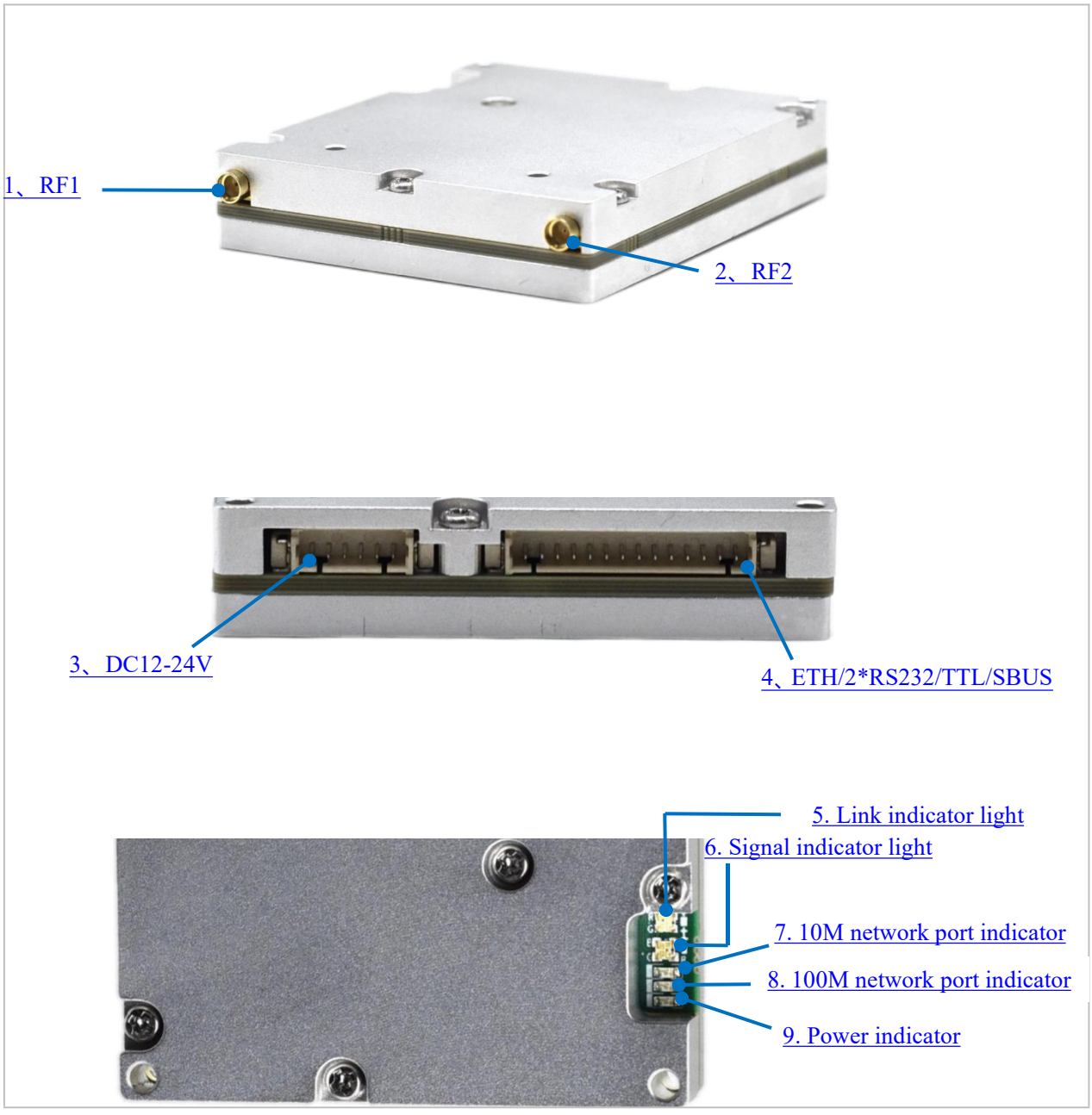
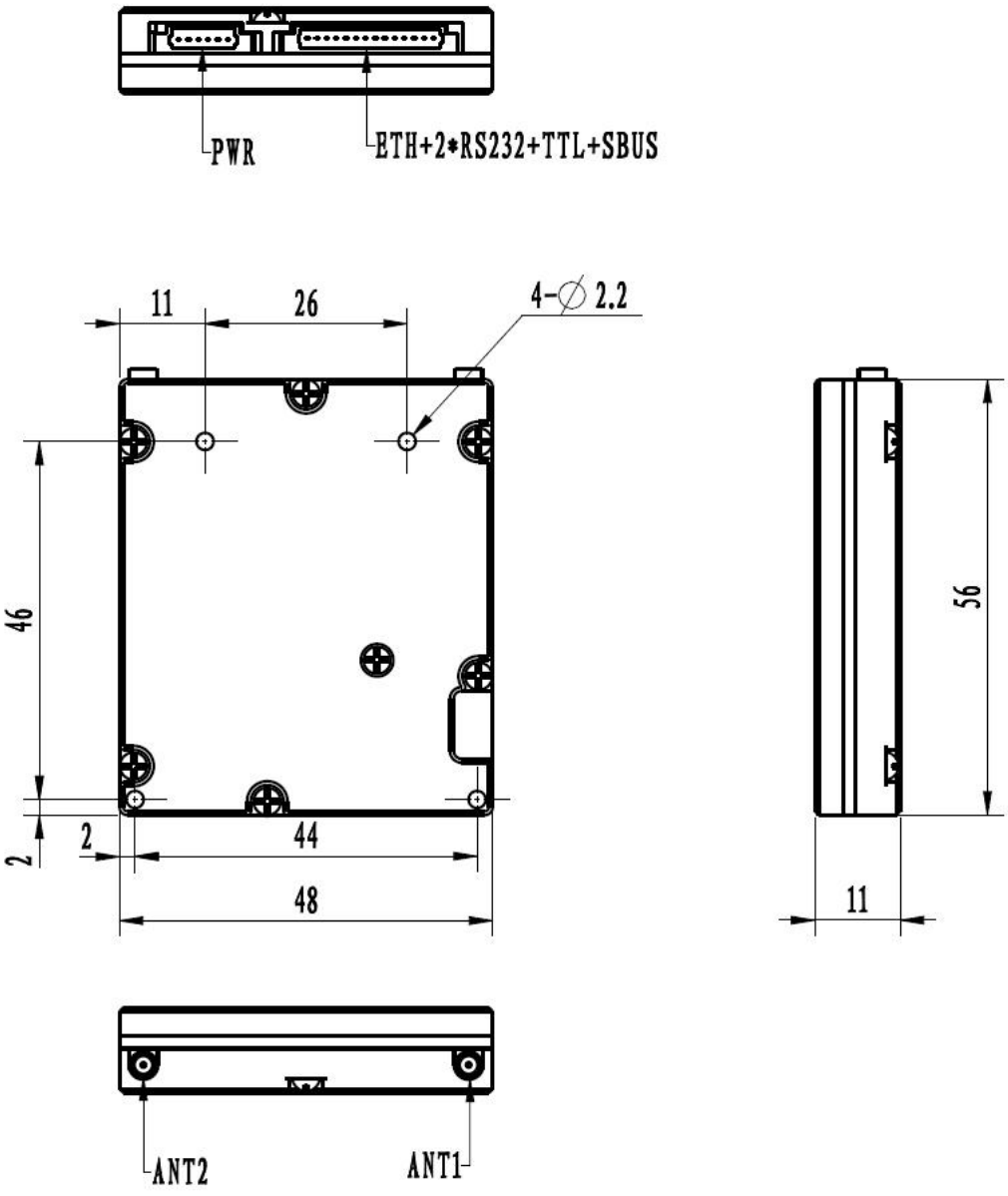
	Consumption	
	Service voltage	24V
	Working temperature	-40℃～+55℃
	Storage temperature	-40℃～+85℃
	Working humidity	5%～95%
	Weight of equipment	64g (including heatsink)
	Device size	57×56×15mm (with heat sink)

5. Product Interface



Interface name	quantity	pilot lamp	quantity
Antenna interface	2	Link status indicator	1
DC12-24V/ETH	1	Signal indicator	1
ETH/2*RS232/TTL/SBUS	1	100M network port indicator	1
		10M network port indicator	1
		power light	1

6. Product size



7. Notes

Determine the operating voltage and current of the development board, the version and interface type of peripherals, and the operating voltage of the serial port, etc.;

Do not overclock this product. Avoid exposing it to heat sources. Use only at normal room temperature for reliable operation.

This product should be operated in a well-ventilated environment. Do not cover it during use. Based on the development board's operational requirements, assess the heat dissipation situation and appropriately install heat sinks or cooling fans for the main chip.

Do not touch the components on the development board with your hands, because static electricity from the human body can easily damage the components;

Do not touch the development board with water, as water will cause short circuit;

Keep the packaging and accessories properly. If not used for a long time, pay attention to moisture and dust protection.

8. Service and Technical Support

Non-human damage is guaranteed for one year.

For industry customers, we can directly provide complete machine applications to help them quickly capture the market.

Provide technical guidance on bare board and integration solutions for customers with certain integration capabilities, enabling them to quickly achieve product differentiation.

For advanced users, we provide comprehensive customization services covering device design, functionality, and software.