

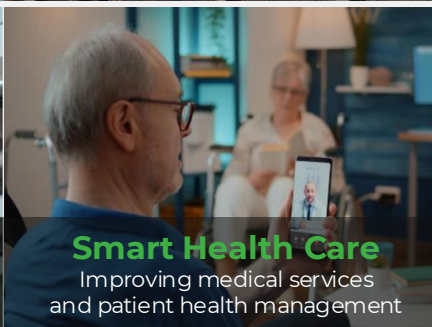
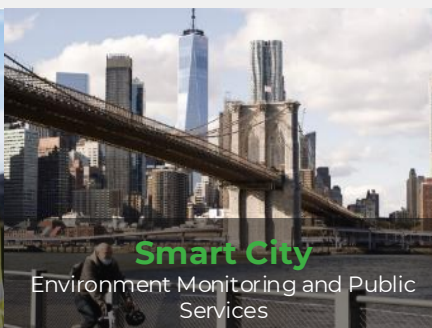
Embrace LPWAN,
Empower Industrial Digitalization.

EC312 Series LoRaWAN Gateway

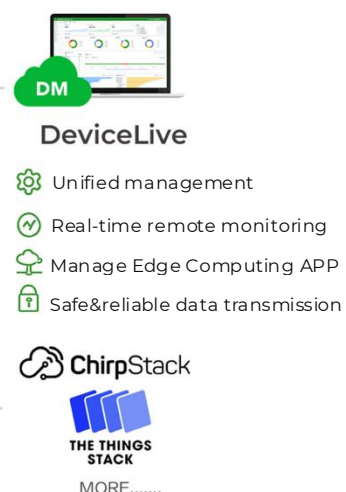
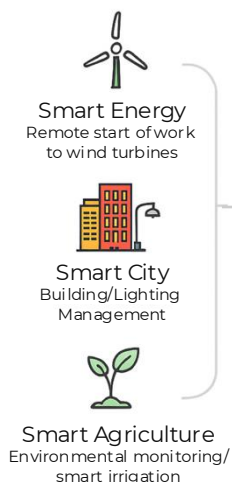
- High-security
- Programmable
- Multi-link
- High-performance
- DeviceLive Cloud-Managed



The EC312 LoRaWAN Gateway is an industrial-grade device with the SX1302 chip, supporting 2,000 nodes and 15 km LOS / 2 km NLOS coverage. With embedded LNS, ChirpStack compatibility, multi-link redundancy, dual SIM failover, and security features like Secure Boot and TPM, it ensures reliable, secure connectivity for smart buildings, industries, and cities.



Solution



Feature and Advantage

High Performance & Programmable Platform

- CPU: ARM Cortex-A53 @1.4GHz, 1G SDRAM + 8G eMMC
- Runs standard Linux (Debian 11)
- Supports customer-developed edge applications
- Integrated Docker for application containerization
- Provides a reliable and flexible software environment for diverse industrial scenarios

Secure and Reliable Operation

- Security features: Secure Boot, TPM 2.0, TrustZone, firewall, VPN
- System protection: Linux system security patching and vulnerability remediation
- Power loss resilience: Supercapacitor design for power-off protection
- Hardware/software watchdog for system monitoring

Robust and Flexible Communication

- Multi-network support: 4G, Wi-Fi, Fast Ethernet
- Redundancy: Wired/cellular/Wi-Fi mutual backup, dual SIM failover
- Resilience: Multilevel link detection, communication self-healing
- Ensures stable, uninterrupted connectivity in complex industrial environments



LoRaWAN Connectivity & Performance

- Powered by Semtech SX1302, supporting up to 2000 nodes
- Low power, up to 15 km range (depending on environment and antenna)
- Built-in LoRaWAN server for quick local deployment, compatible with mainstream servers

Efficient Data Acquisition with DeviceSupervisor™

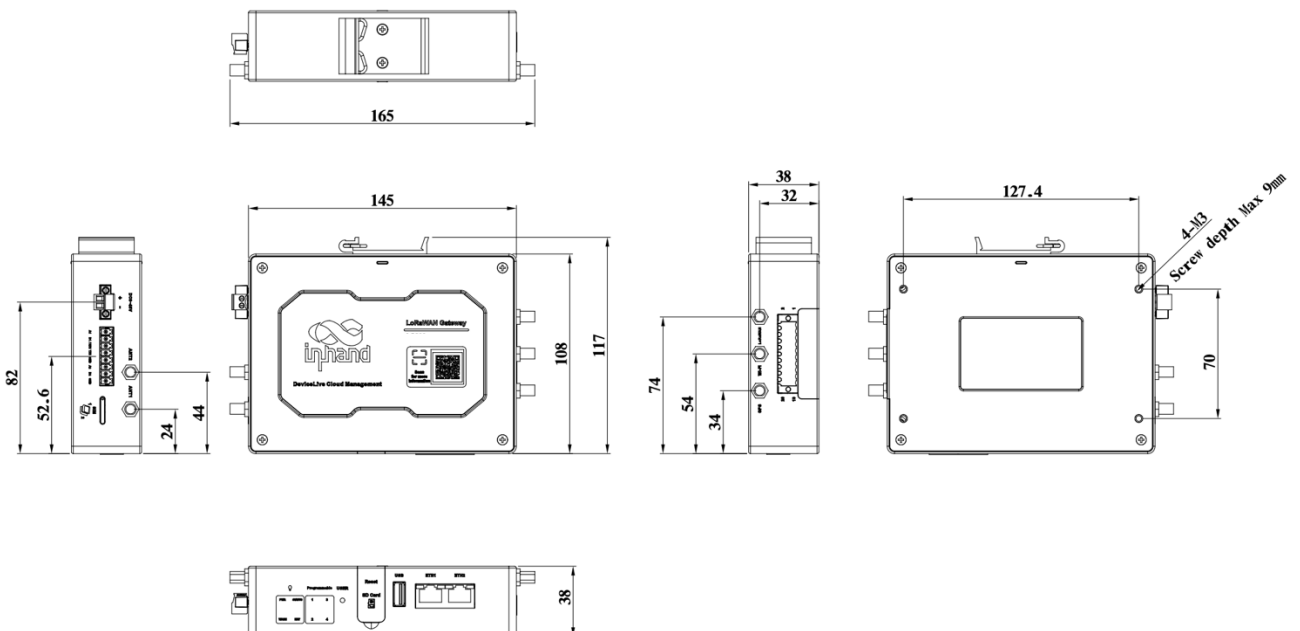
- "Zero code/Low code" cloud integration for fast deployment
- Supports 80+ industrial protocols: Modbus/TCP, OPC UA, BACnet, etc.
- Integrated data publishing services for public/private cloud and local SCADA

Intelligent Remote Management via DeviceLive

- Remote batch management of devices and edge AI applications
- Containerized application remote deployment and lifecycle management
- Secure remote access and maintenance



Dimensions (mm)



Product Specifications

Hardware Specifications			
Item	EC312		
System			
CPU	ARM Cortex-A53 @1.4GHz		
RAM	1GB DDR4		
FLASH	8GB eMMC		
LoRaWAN			
Baseband Chip	Semtech SX1302		
Channel	8, Half-duplex		
Frequency	RU864/IN865/EU868/US915/AU915/KR920/AS923/CN470		
Maximum EIRP	27 dBm		
Receiver Sensitivity	-140 dBm (125KHz/SF12)		
Node Capacity	2000		
Communication Range	2 km NLOS coverage in urban areas, 15 km LOS coverage (depending on the environment and antenna installation method)		
Interfaces			
Ethernet Port	2 * 10/100Mbps Ethernet port		
Serial Port	1 * RS-232/485+1 * RS-485, Isolation		
USB	USB2.0, 1 * Type A		
SIM Card	Nano SIM x 2		
Antenna Connector	LTE: SMA * 1, Wi-Fi: SMA *1, GPS: SMA *1, LoRaWAN: SMA *1 Note: LTE antenna connector for North American models: SMA * 2		
Wi-Fi	STA, 802.11ac/a/b/g/n, 2.4G/5G		
Bluetooth	BLE 4.2		
GNSS	Satellite location GPS, 1 * SMA		
Button	Pinhole reset button *1; Programmable button *1		
TF card	MicroSD support, up to 32GB expansion		
Safety			
Secure Boot	Support		
TrustZone	Support		
TPM	Integrated TPM chip, TPM v2.0		
Others			
RTC	Support (button battery backup)		
Hardware watchdog	Support		
Power			
Power input	9-48V DC		
Power failure protection	Hold for 20 seconds after power failure (safeshutdown)		
Power failure alarm	Power failure alarms when power failure happens		
Mechanical characteristics			
Installation	Panel, Rail	Weight	339g
Dimensions	145*106 * 36mm	Protection Rating	IP30
Housing	Metal + Plastic	Cooling	Fanless
Ambient Temperature And Humidity			
Storage Temperature	-40 ~ 85°C	Ambient humidity	5~95% (non-condensing)
Operation temperature	-20~ 70°C		
Indicator			
LED	PWR, STATUS, WARN, NET, USER * 4		

Software Specifications	
Item	EC312
Operating System	
OS	Debian 11, Kernel 5.10.168
LoRaWAN	
LNS	Built-in LoRaWAN network server Compatible with mainstream network servers such as The ThingsStack, ChirpStack, etc.
Protocol	LoRaWAN 1.0/1.0.2, Class A/B/C
Internet	
Access authentication	APN, VPDN
Internet access	CHAP, PAP
Network format	LTE CAT1
LAN protocol	ARP, Ethernet
WAN protocol	Static IP, DHCP
Network Protocol	
IP Application	ICMP, DNS, TCP/UDP, TCP Server, DHCP
IP Routing	Static routing
Security	
Multilevel user	Multi-level management rights
Data security	Firewall
	Open VPN, IPsec VPN
Reliability	
Link Detection	Sends heartbeat packets to detect, auto redials when disconnected
Dual SIM Failover	Supports dual SIM failover
Embedded Watchdog	Device runs self-detection, auto recovers from malfunctions
Open Platform	
Secondary development environment	Multi-programming language development platform
Access cloud platform	AWS, Azure, Ali and other cloud platforms
Data Collection Protocol	
Industrial Protocol	Modbus RTU Master/Slave, Modbus TCP Master/Slave, EtherNet/IP, ISO on TCP, OPC UA Client/Server, Mitsubishi MC 3C/3E/3C Over TCP, Mitsubishi CPU Port, FINSUDP, HostLink, PPI, DLT645-2007, IEC104Server
Network Management	
Configuration	Web, Telnet, SSH
Upgrade	Web, FOTA, DFOTA
Log	Support local system log, remote log and important log power-off autosave
Configuration backup	Import and export configuration files
Remote management	InHand DeviceLive or HTTP, HTTPS, Telnet, SSH, etc.
Platform Feature	Supports cloud-based parameter configuration, container management, application and firmware management



Product Specifications

Hardware Specifications			
Item	EC312		
EMC			
Static	EN61000-4-2, level 3		
Radiation Electric Field	EN61000-4-3, level 3		
Pulsed Electric Field	EN61000-4-4, level 3		
Surge	EN61000-4-5, level 3		
Conducted Disturbance Immunity	EN61000-4-6, level 3		
Shock Wave Resistance	EN61000-4-12, level 3		
Power Frequency Magnetic Field Resistance	EN61000-4-8, horizontal / vertical 400A/m (>level 2)		
Physical Specs			
Shockproof	IEC60068-2-27	Vibration Resistance	IEC60068-2-6
Free Fall	IEC60068-2-32		
Certification			
CE, FCC, IC, PTCRB			

Ordering Guide

Minimum Model	<WMNN>: Cellular Type & Module	LoRaWAN	RAM	FLASH	Ethernet Port	Serial Port	GNSS/ Wi-Fi/ BT/TPM
EC312-H-FQ53-L868	EMEA CAT1 FDD: B1/B3/B7/B8/B20/B28 TDD: B38/B40/B41 GSM: B2/B3/B5/B8	EU868	1GB	8GB	2 * 10/100M	1 * RS232/485 +1 * RS485	YES
EC312-H-FQ33-L915	North America CAT1 FDD: B2/B4/B5/B12/B13/B25/B26 WCDMA: B2/B4/B5	US915/ AS923	1GB	8GB	2 * 10/100M	1 * RS232/485 +1 * RS485	YES
EC312-H-FQ53-L915	EMEA CAT1 FDD: B1/B3/B7/B8/B20/B28 TDD: B38/B40/B41 GSM: B2/B3/B5/B8	US915/ AS923	1GB	8GB	2 * 10/100M	1 * RS232/485 +1 * RS485	YES
EC312-H-LQA3-L470	China CAT1 LTE-FDD B1/B3/B5/B8 LTE-TDD B34/B38/B39/B40/B41	CN470	1GB	8GB	2 * 10/100M	1 * RS232/485 +1 * RS485	YES

About Us

InHand Networks is a leading IoT solutions provider founded in 2001, dedicated to driving digital transformation across industries and empowering customers to unlock their full potential and achieve accelerated growth.

We specialize in delivering industrial-grade connectivity solutions for diverse sectors, such as enterprise networks, industrial and building IoT, digital energy, smart commerce, and mobility. Our comprehensive product portfolio and services cater to various applications worldwide, including smart manufacturing, smart grid, intelligent transportation, smart retail, etc. With a global footprint spanning over 60 countries, we serve customers in China, the United States, France, Germany, the United Kingdom, Italy, and beyond.



3650 Concorde Pkwy, Suite 200
Chantilly, VA 20151, USA
T: +1 (703) 348-2988
E: info@inhand.com
www.inhand.com