

Embrace LPWAN, Empower Industrial Digitalization



EC312 LoRaWAN Gateway

· Multi-link

· LoRaWAN

· Programmable

· Cloud-managed

1. Product Overview

EC312 is an industrial-grade LoRaWAN gateway designed for large-scale LPWAN deployments with secure, reliable, and cloud-manageable connectivity.

Key features:

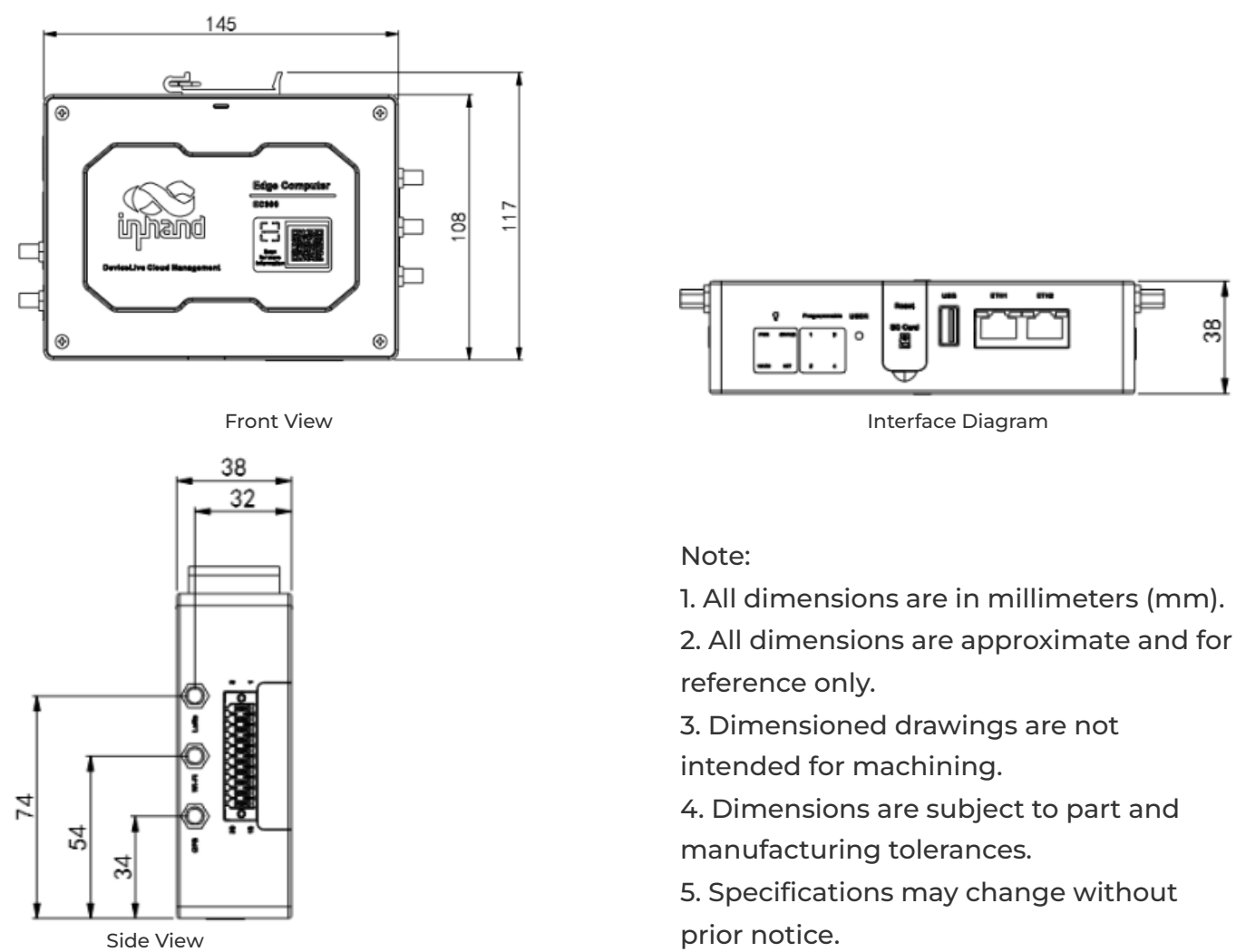
- **High-capacity LoRaWAN:** Semtech SX1302, up to 2,000 node access
- **Wide coverage:** Up to 15 km LOS / 2 km NLOS (deployment dependent)
- **Reliable communications:** Ethernet/cellular/Wi-Fi backup with dual SIM failover
- **Security architecture:** Secure Boot, TPM 2.0, TrustZone, firewall, VPN
- **Open edge platform:** Debian 11 + Docker + DeviceLive remote management

Core Technical Specifications

Technical Indicator	Specification
LoRaWAN Capability	SX1302, 8-channel half-duplex, up to 2,000 nodes
Cellular Access	LTE Cat1, APN/VPDN, CHAP/PAP
Network Features	ARP/Ethernet, static IP/DHCP, ICMP, DNS, TCP/UDP, static routing
Security	Multi-level user roles, firewall, OpenVPN, IPSec VPN
Open Platform	Debian 11 + Docker, cloud integration for AWS/Azure/AlibabaCloud
Device Management	Web/Telnet/SSH, FOTA/DFOTA, local/remote logs, DeviceLive remote operations
Dimensions (W x D x H)	145 x 106 x 36 mm
Weight	339 g
Interfaces	2xFE, 1xRS-232/485 + 1xRS-485, USB2.0 Type-A, Nano SIM x2
Power Input	9 to 48 V DC
Operating Temperature	-20 to 70 C

Technical Indicator	Specification
Protection and Certifications	IP30, CE/FCC/IC/PTCRB

2. Product Dimensions



- Note:
- 1. All dimensions are in millimeters (mm).
 - 2. All dimensions are approximate and for reference only.
 - 3. Dimensioned drawings are not intended for machining.
 - 4. Dimensions are subject to part and manufacturing tolerances.
 - 5. Specifications may change without prior notice.

3. Hardware Specifications

Category/Parameter	Specification
Hardware Platform	
CPU	ARM Cortex-A53 @ 1.4 GHz

Category/Parameter	Specification
RAM	1 GB DDR4
FLASH	8 GB eMMC
LoRaWAN Performance	
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	Up to 2,000 nodes
Communication Range	2 km NLOS / 15 km LOS (depending on environment and antenna installation)
Connectivity & Interfaces	
Ethernet Ports	2 x 10/100 Mbps FE
Serial Ports	1 x RS-232/485 + 1 x RS-485 (isolated)
SIM Card Holders	Nano SIM x2
Antenna Connectors	LTE: SMA x1, Wi-Fi: SMA x1, GPS: SMA x1, LoRaWAN: SMA x1 (North American LTE model: SMA x2)
USB	USB 2.0 Type-A
Buttons	Pinhole reset button x1; programmable button x1
TF Card	MicroSD support, up to 32GB expansion
LED Indicators	PWR, STATUS, WARN, NET, USER x4
WiFi	Wi-Fi STA (802.11ac/a/b/g/n, 2.4/5 GHz)
Bluetooth	BLE 4.2

Category/Parameter	Specification
GPS	Satellite location GPS, 1 x SMA
Power & Power Consumption	
Power Input	9 to 48 V DC
Power Interface	DC terminal input (industrial terminal block)
Power Failure Protection	Hold for 20 seconds after power failure (safe shutdown)
Power Failure Alarm	Power failure alarms when power failure happens
Mechanical Specifications	
Product Dimensions	145 x 106 x 36 mm
Product Weight	339 g
Mounting Method	Panel mounting / DIN-rail mounting
Protection Rating	IP30
Enclosure & Heat Dissipation	Metal + plastic enclosure, fanless design
RTC	Support (button battery backup)
Hardware Watchdog	Supported
TPM	TPM 2.0
Environment & Certifications	
Storage Temperature	-40 to 85 °C
Operating Temperature	-20 to 70 °C
Environmental Humidity	5 to 95% RH (non-condensing)

Category/Parameter	Specification
Physical Characteristics	IEC60068-2-27 shock resistance IEC60068-2-6 vibration resistance IEC60068-2-32 drop resistance
EMC Standard	EN61000-4-2, level 3, Static EN61000-4-3, level 3, Radiation Electric Field EN61000-4-4, level 3, Pulsed Electric Field EN61000-4-5, level 3, Surge EN61000-4-6, level 3, Conducted Disturbance Immunity EN61000-4-8, Power Frequency Field Resistance, horizontal / vertical 400A/m (>level 2) EN61000-4-12, level 3, Shock Wave Resistance
Certifications	CE, FCC, IC, PTCRB

4. Software Specifications

Category/Parameter	Specification
Operating System	
Operating System	Debian 11 (Kernel 5.10.168)
LoRaWAN	
LoRaWAN LNS	Built-in LoRaWAN network server, compatible with The Things Stack and ChirpStack
LoRaWAN Protocol	LoRaWAN 1.0/1.0.2, Class A/B/C
Network Features	
Network Type	LTE Cat1
Network Access	APN, VPDN
Access Authentication	CHAP, PAP
WAN Protocols	Static IP, DHCP
LAN Protocols	ARP, Ethernet

Category/Parameter	Specification
IP Applications	ICMP, DNS, TCP/UDP, TCP Server, DHCP
IP Routing	Static routing
Security	
Secure Boot	Supported
Trust Zone	TrustZone supported
Network Security	Firewall
Data Security	OpenVPN, IPSec VPN
User Management	Multi-level user roles / management rights
Reliability	
Link Detection	Heartbeat-based link detection with auto reconnect
Built-in Watchdog	Embedded watchdog
Dual SIM Switchover	Supported
Open Platform & Data Acquisition Protocols (DSA)	
Secondary Development Environment	multi-programming language development platform
Access Cloud Platform	AWS, Azure, Ali and other cloud platforms
Docker	Supported
Industrial Protocols	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, IEC104 Server
Network Management	

Category/Parameter	Specification
Configuration Method	Web / Telnet / SSH
Upgrade Method	Web, FOTA, DFOTA
Log Functions	Support local system log, remote log, and important log power-off autosave
Configuration Backup	Import/export of configuration files
Remote Management	InHand DeviceLive or HTTP / HTTPS / Telnet / SSH
Platform Feature	Supports cloud-based parameter configuration, container management, application and firmware management

5. Ordering Information

Model Rule

Model code: EC312-H-<WMNN>-<Lxxx>

<WMNN>: Cellular Type & Module

<Lxxx>: LoRaWAN regional band

Model List

Model	Region	<WMNN>	<Lxxx>: LoRaWAN
EC312-H-FQ53-L868	EMEA	CAT1 FDD: B1/B3/B7/B8/B20/B28 TDD: B38/B40/B41 GSM: B2/B3/B5/B8	EU868
EC312-H-FQ33-L915	North America	CAT1 FDD: B2/B4/B5/B12/B13/B25/B26 WCDMA: B2/B4/B5	US915/AS923

EC312-H-FQ53-L915	EMEA	CAT1 FDD: B1/B3/B7/B8/B20/B28 TDD: B38/B40/B41 GSM: B2/B3/B5/B8	US915/AS923
EC312-H-LQA3-L470	China	CAT1 LTE-FDD: B1/B3/B5/B8 LTE-TDD: B34/B38/B39/B40/B41	CN470