Industrial Outdoor LoRaWAN 5G NR Cellular Gateway

Connecting to 5G NR and LoRa Network with Excellent LoRaWAN Cellular Gateway

PLANET LCG-350W-NR is an Industrial-grade Outdoor 5G NR Cellular LoRaWAN Gateway with reliable connectivity for IoT deployments. It is able to provide ultra-fast broadband access with 5G cellular network.

The LCG-350W-NR offers seamless wireless connectivity through compliance with IEEE 802.11b/g/n standards and is optimized for diverse LoRa applications with support for multiple frequency bands. Thus, the LCG-350W-NR is perfect for diverse regional applications. It provides secure wired network access via a 10/100BASE-T Ethernet interface with PoE+ and built-in electromagnetic isolation protection.

The LCG-350W-NR is built to endure harsh conditions, featuring an IP67 rating for dust and water resistance and operating in a wide temperature range. It includes integrated power protection, an MQTT broker for IoT data communication, strong VPN security, and compatibility with remote management systems. The LCG-350W-NR is the ideal choice for secure, reliable, and flexible networking in any scenario.

Ultra-fast 4G/5G Network*

The LCG-350W-NR supports 5G NR DL (downlink) speeds higher than 3.6 Gbps and 4G LTE DL speeds of up to 2 Gbps. Its wide spectrum bandwidth accelerates internet speeds and reduces network latency for premium and time-sensitive connectivity services. It also supports multi-band connectivity including LTE FDD/TDD, WCDMA and GSM for a wide range of applications.

*The real 5G NR/4G LTE data rate is dependent on local service provider.

Highlights

- Supports global 5G NR (NSA/SA) and 4G LTE with a Nano-SIM card slot for reliable cellular access.
- Compliant with IEEE 802.11b/g/n standards for wireless connectivity.
- Supports EU868, IN865, RU864, US915, AU915, KR920 and AS923 frequency bands for various regional applications.
- 8 programmable parallel paths for better data processing
- 10/100BASE-T Ethernet LAN interface with 802.11at PoE+ support and built-in 1.5KV electromagnetic isolation protection
- Built-in reverse phase, overvoltage, and lightning protection
- Supports both 100-277V AC input and 802.11at PoE+ power.
- Integrated MQTT broker for efficient IoT data communication
- Supports SSL VPN and robust hybrid VPN protocols (IPSec/PPTP/L2TP over IPSec) for secure data transmission.
- Features Stateful Packet Inspection (SPI) firewall and content filtering to block DoS/DDOS attacks and manage port range forwarding.
- Compatible with Planet NMS controller system and CloudViewerPro app for easy remote management and monitoring.
- Operates in -40°C to 75°C; IP67-rated for dust and water resistance.

Hardware

- 1 x 10/100BASE-T RJ45 LAN port with 802.3at PoE+
- 2 x 5G NR antennas
- 1 x Nano-SIM card slot
- 1 x LoRa antenna
- 1 x Wi-Fi antenna
- 1 x GPS antenna
- 1 x reset button

Cellular Interface

- Supports multi-band connectivity with 5G NR (NSA/SA), LTE-FDD, LTE-TDD, and WCDMA.
- Built-in SIM and broadband backup for network redundancy
- Four detachable antennas for 5G NR connection
- LED indicators for signal strength and connection status

Download speed up to **2.4 Gbps**

5G

10x faster than 4G
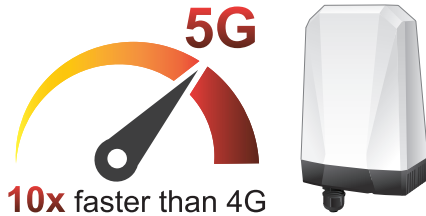
GPS Included

The LCG-350W-NR is equipped with global positioning system feature. It adopts the 5G-NR technology that incorporates multiple global navigation systems (BDS/GPS/GLONASS/GALILEO/QZSS/SBAS). It helps to position location of cellular gateway based on a network of satellites that continuously transmit necessary data. More signals transmitted from more satellites can triangulate its location on the ground, meaning any location can be easily tracked.

GPS/GNSS Positioning

GPS Status

Attribute	Value
Latitude	24.982556
Longitude	121.537012
Horizontal	0.9
Altitude	74.1
Date	2021/08/17
Time	07:25:56
Satellite	4

Location:
(24.982556,121.537012)

LoRaWAN Compatibility

The LCG-350W-NR is LoRaWAN-compatible, ensuring smooth operation with LoRa sensors. LoRaWAN is a low-power, wide area networking protocol built on top of the LoRa radio modulation technique. LoRaWAN networks and devices such as sensor and gateway allow public or private network to connect multiple applications such as IoT, M2M, smart city, sensor network, and industrial automation applications in the same space.

Enhanced IoT Efficiency with LCG-300 Series

The LCG-300 series gateways support the expanding LoRa IoT ecosystem by converting sensor data into easily readable JSON format. This feature allows sensor data to be read without the need for external applications to parse the data, thus significantly simplifying the data integration process and reducing the time required to deploy IoT solutions.

Humidity Sensor

LoRa

011011100000001111010

LCG Series

Publish

"Humidity (%)": 75

MQTT

Application Server
TTN/MQTT Broker

LoRa Interface

- Supports EU868, IN865, RU864, US915, AU915, KR920 and AS923.
- 8 programmable parallel demodulation paths

RF Interface Characteristics

- Features 2.4GHz (802.11b/g/n) band for configuration.
- 2T2R MIMO technology for simple wireless connection

IP Routing Feature

- Static route
- Dynamic route
- OSPF

Firewall Security

- Cybersecurity
- Stateful Packet Inspection (SPI) firewall
- Blocks DoS/DDoS attack
- Content filtering
- MAC filtering and IP filtering
- NAT ALG (Application Layer Gateway)
- Blocks SYN/ICMP flooding

VPN Features

- IPSec/Remote Server (Net-to-Net, Host-to-Net), GRE, PPTP Server, L2TP Server and SSL Server/Client (Open VPN)
- Max. Connection Tunnel Entries: 30 VPN tunnels,
- Encryption methods: DES, 3DES, AES, AES-128/192/256
- Authentication methods: MD5, SHA-1, SHA-256, SHA-384, SHA-512

Networking

- DHCP server/NTP client for LAN
- Protocols: TCP/IP, UDP, ARP, IPv4, IPv6
- Port forwarding; IGMP; UPnP; SNMPv1,v2c, v3
- DDNS: PLANET DDNS, Easy DDNS, DynDNS and No-IP
- MQTT Broker

Additionally, the built-in MQTT broker in the LCG-300 series facilitates data parsing and collection, enabling users to obtain data quickly and conveniently. This is possible both through the internal MQTT broker and an external MQTT broker. This functionality helps reduce the costs associated with building network servers and minimizes the complexity of the network architecture.
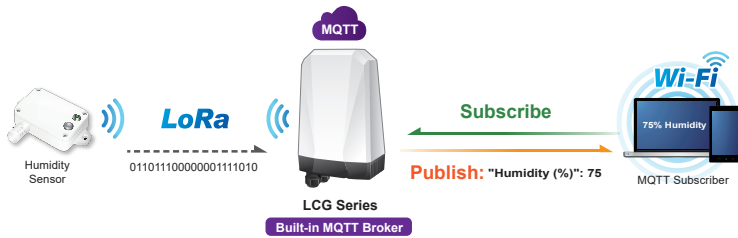

Others

- Setup wizard
- Dashboard for real-time system overview
- Supported access by HTTP or HTTPS
- Auto reboot
- PLANET NMS System and Smart Discovery Utility for deployment management
- Planet CloudViewerPro app for real-time monitoring

Ideal High-Availability VPN Security Router Solution for Industrial Environment

The LCG-350W-NR provides complete data security and privacy for accessing and exchanging the most sensitive data, built-in IPSec VPN function with DES/3DES/AES encryption and MD5/SHA-1/SHA-256/SHA-384/SHA-512 authentication, and GRE, SSL, PPTP and L2TP server mechanism. The full VPN capability in the LCG-350W-NR makes the connection more secure, flexible, and capable.
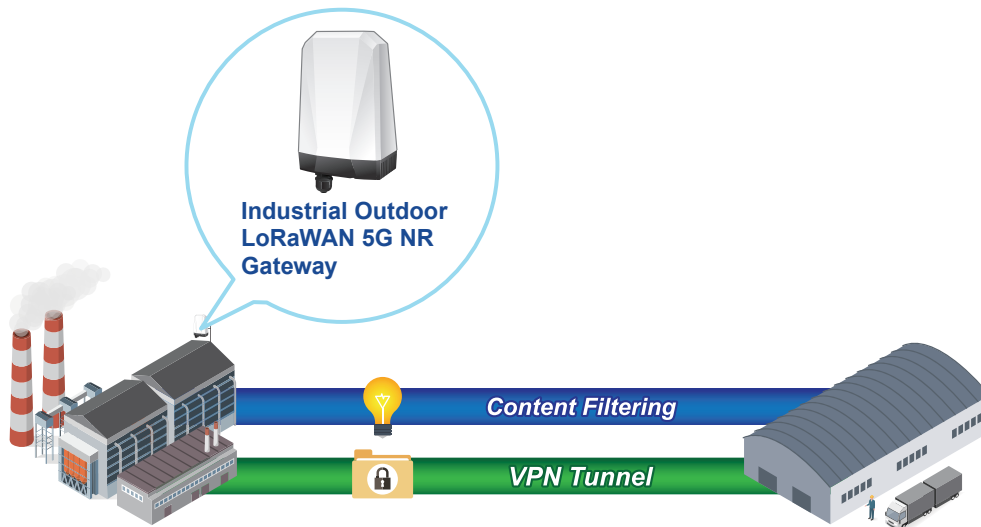
Excellent Ability in Threat Defense

The LCG-350W-NR has built-in SPI (stateful packet inspection) firewall and DoS/DDoS attack mitigation functions to provide high efficiency and extensive protection for your network. Thus, virtual server and DMZ functions can let you set up servers in the Intranet and still provide services to the Internet users.
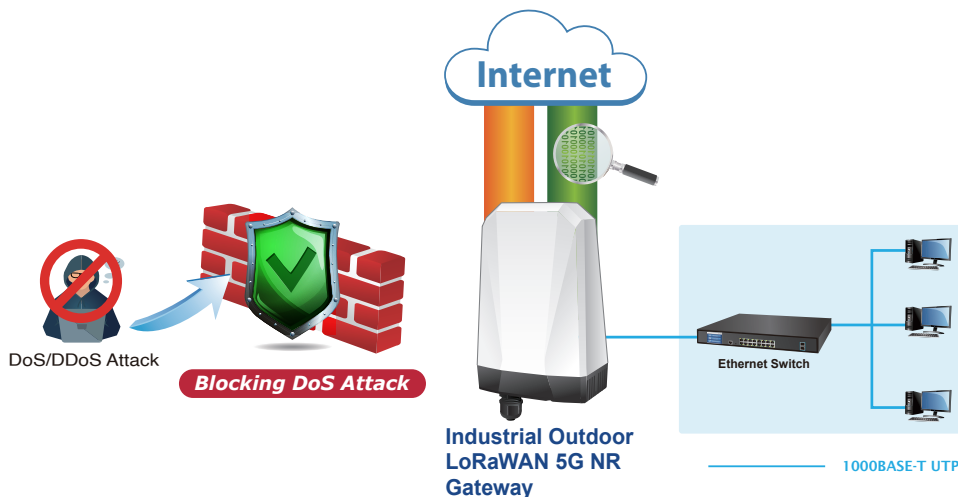
Cybersecurity Network Solution to Minimize Security Risks

The cybersecurity feature included to protect the switch management in a mission-critical network virtually needs no effort and cost to install. For efficient management, the LCG-350W-NR is equipped with HTTPS web and SNMP management interfaces. With the built-in web-based management interface, the LCG-350W-NR offers an easy-to-use, platform-independent management and configuration facility. The LCG-350W-NR supports SNMP, allowing it to be managed via any management software based on the standard SNMP protocol.

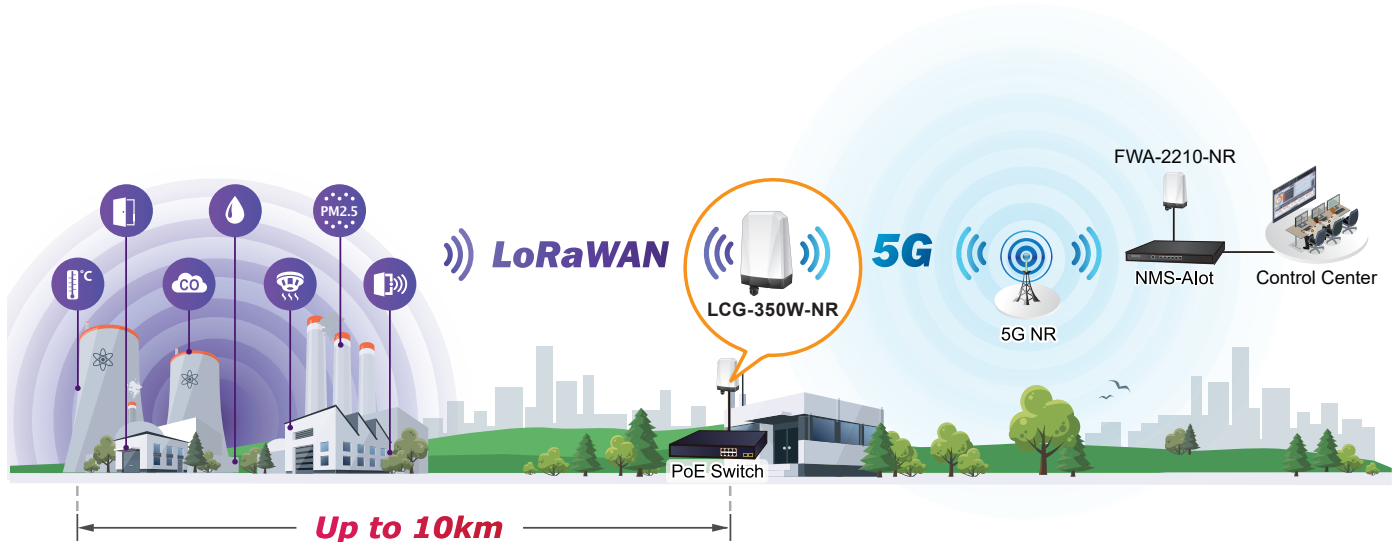### Maximizing Work Efficiency with PLANET SD-WAN Gateway

PLANET LCG-350W-NR incorporated in SD-WAN (software-defined wide area network) function can greatly increase WAN optimization for managing multiple WAN. With SD-WAN, users can connect any application across all available network connections at every site. It improves application performance and provides a high-quality user experience for increasing business productivity and reducing IT costs.

Applications

Integrated LoRa and 5G NR Cellular Communication Solution

PLANET LCG-350W-NR LoRaWAN Gateway is the solution for AIoT applications, seamlessly integrating LoRa, LoRaWAN, and 5G NR cellular technologies to provide superior performance and connectivity. Supporting both LoRa and LoRaWAN standards, the LCG-350W-NR allows transceivers to work with various LoRaWAN sensor devices such as temperature, humidity, water leak sensors, smoke detectors, and PM2.5 sensors. Additionally, legacy sensors can be connected via LoRa Node controllers, capturing and transmitting critical data over long distances through the LoRa wireless network.

The LCG-350W-NR then transmits the collected data via Ethernet or 5G NR to the Network Server, such as an AIoT device, which manages the network and efficiently distributes the data to the relevant applications. Thanks to the integration of the advanced 5G NR technology, the LCG-350W-NR surpasses the 100-meter limitation of RJ45 cables, enabling data transmission over vast distances without the constraints of wired connections. The LCG-350W-NR also includes advanced networking features such as VPN, Modbus, and comprehensive network management, making it highly versatile across various industries.

Specifications

Product	LCG-350W-NR
Hardware Specifications	
Ethernet	1 10/100BASE-T RJ-45 Ethernet
Cellular Antenna	2 x 3 dBi internal antennas
SIM Interface	1 Nano-SIM card slot
LoRa Antenna	2 dBi internal antennas with SMA connectors for LoRa
Reset Button	< 5 sec: System reboot > 5 sec: Factory default
Enclosure	IP67 rating
Installation	Wall hanging, pole mounting
LED Indicators	PWR (Blue) Internet (Blue) LoRa (Blue) 4G/5G (Blue) Wi-Fi (Blue)
Dimensions (W x D x H)	150 x 100 x 240 mm
Weight	1045g
Power Requirements	48V DC IN, 0.5A, IEEE 802.3at PoE+ or 100~277V AC IN, 0.5A
Power Consumption	Max. 2.4 watts/8.19 BTU (No Loading) Max. 3.3 watts/11.26 BTU (Full loading)
LoRaWAN	
Frequency Band	Suffixes 868: supported EU868, IN865, RU864 915: supported US915, AU915, KR920, AS923
Receiving Sensitivity	-140dBm
Output Power	26±1dBm
Multi Band Support	

5G Sub6 Band	LCG-350W-NR-EU:
	  n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n75/n76/n77/n78
	LCG-350W-NR-NA:
	  n2/n5/n12/n14/n25/n30/n41/n48/n66/n70/n71/n77

LTE Band	LCG-350W-NR-EU:
	  LTE FDD: B1/B3/B5/B7/B8/B20/B28/B32
	  LTE TDD: B38/B40/B41/B42/B43
	LCG-350W-NR-NA:
	  LTE FDD: B2/B4/B5/B12/B13/B29/B30/B66/B71
	  LTE TDD: B41/B46(LAA)/B48

WCDMA	LCG-350W-NR-EU: B1/B5/B8
GNSS	BDS/GPS/GLONASS/GALILEO/QZSS/SBAS
Data Transmission Throughput	3.4Gbps (DL)/350Mbps (UL) for 5G NR 2Gbps (DL)/150Mbps (UL) for LTE Cat20 42Mbps (DL)/5.76Mbps (UL) for HSPA+
Wireless	
Standard	IEEE 802.11b/g/n 2.4GHz
Band Mode	2.4G Only
Frequency Range	2.4GHz FCC: 2.412~2.462GHz ETSI: 2.412GHz~2.472GHz
Operating Channels	2.4GHz FCC: 1~11 ETSI: 1~13
Channel Width	20/40MHz
Data Transmission Rates	Transmit: 150 Mbps* for 2.4 GHz Receive: 150 Mbps* for 2.4 GHz *The estimated transmission distance is based on the theory. The actual distance may vary in different environments.

Transmission Power	11b: 26dBm ± 1dBm @11Mbps
	11g: 24dBm ± 1.5dBm @54Mbps
	11g/n:
	  20dBm ± 1.5dBm @MCS7, HT20
	  17dBm@MCS7,HT40

Encryption Security	WEP (64/128-bit) encryption security WPA / WPA2 (TKIP/AES) WPA-PSK / WPA2-PSK (TKIP/AES) WPA3 personal 802.1x Authenticator
Wireless Advanced	Wi-Fi Multimedia (WMM) Auto channel selection Wireless output power management MAC address filtering
Max. SSID	4
Max. Wireless Clients	64 (32 is suggested, depending on usage)

Security Service	
Firewall Security	Cybersecurity SSL (HTTPS) Inspection Stateful Packet Inspection (SPI) Blocks DoS/DDoS attack
NAT	Port forwarding UPnP
Content Filtering	MAC filtering IP filtering Web filtering
Management	MQTT Broker

Networking	
Operation Mode	Routing mode
Routing Protocol	Static Route, Dynamic Route (RIP), OSPF
Multicast	IGMP Proxy
Protocol	IPv4, IPv6, TCP/IP, UDP, ARP, HTTP, HTTPS, NTP, DNS, PLANET DDNS, PLANET Easy DDNS, DHCP, PPPoE, SNMPv1/v2c/v3,

Advanced Functions	
VPN Function	IPSec/Remote Server (Net-to-Net, Host-to-Net) GRE PPTP Server L2TP Server SSL Server/Client (Open VPN)
VPN Tunnels	Max. 30
VPN Throughput	Max. 50Mbps
Encryption Methods	DES, 3DES, AES or AES-128/192/256 encryption
Authentication Methods	MD5/SHA-1/SHA-256/SHA-384/SHA-512 authentication algorithm

Management	
Basic Management Interfaces	Web browser SNMP v1, v2c PLANET Smart Discovery utility and NMS controller supported PLANET CloudViewerPro app
Secure Management Interfaces	SSHv2, TLSv1.2/1.3, SNMP v3
System Log	System Event Log
Others	Setup wizard Dashboard System status/service Statistics Connection status Auto reboot Diagnostics

Standards Conformance	
Regulatory Compliance	CE
Electrostatic Discharge (ESD) Immunity Test	IEC 61000-4-2, Level 4
Surge Immunity Test	IEC 61000-4-5, Level 4

Electrical Fast Transient (EFT) Burst Immunity Test	IEC 61000-4-4, Level 4
Environment	
Operating	Temperature: -40 ~ 75 degrees C Relative humidity: 5 ~ 90% (non-condensing)
Storage	Temperature: -40 ~ 85 degrees C Relative humidity: 5 ~ 90% (non-condensing)

Ordering Information

Dimensions (W x D x H): 156 x 89 x 241 mm
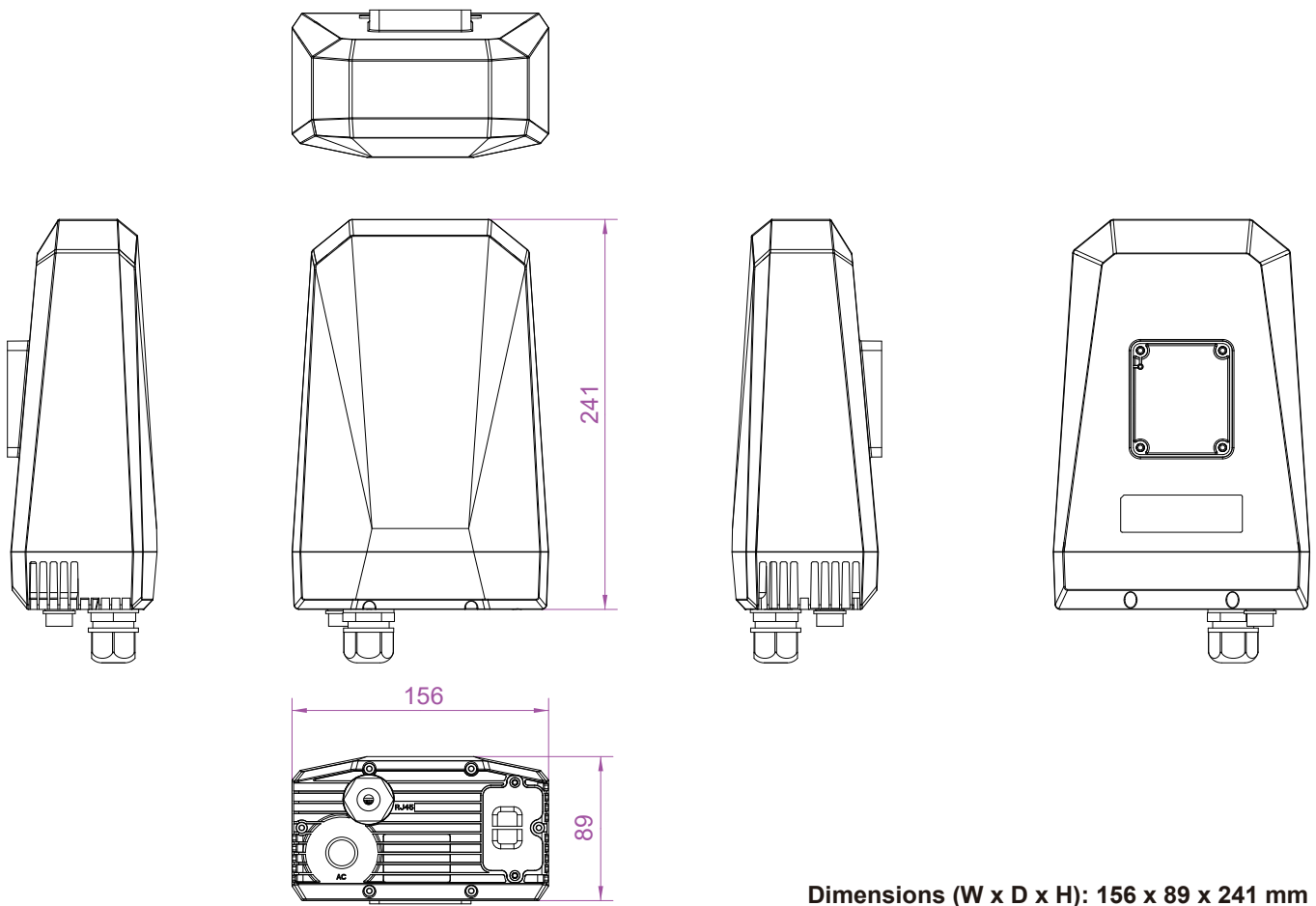
Ordering Information

LCG-350W-NR-EU868	Industrial Outdoor LoRaWAN 5G NR Cellular Gateway (Sub-6 5G NR EAU, EU868 Sub 1G, -40~75 degrees C)
LCG-350W-NR-US868	Industrial Outdoor LoRaWAN 5G NR Cellular Gateway (Sub-6 5G NR US, EU868 Sub 1G, -40~75 degrees C)
LCG-350W-NR-EU915	Industrial Outdoor LoRaWAN 5G NR Cellular Gateway (Sub-6 5G NR EAU, US915 Sub 1G, -40~75 degrees C)
LCG-350W-NR-US915	Industrial Outdoor LoRaWAN 5G NR Cellular Gateway (Sub-6 5G NR US, US915 Sub 1G, -40~75 degrees C)

Related Products

LCG-300-EU	Industrial LoRaWAN Gateway with 5-Port 10/100/1000T (2 DI/DO, -40~75 degrees C, EU868 Sub 1G)
LCG-300-US	Industrial LoRaWAN Gateway with 5-Port 10/100/1000T (2 DI/DO, -40~75 degrees C, US915 Sub 1G)
LCG-300W-EU	Industrial LoRaWAN Wireless Gateway with 5-Port 10/100/1000T (802.11ax 1800Mbps, 2 DI/DO, -40~75 degrees C, EU868 Sub 1G)
LCG-300W-US	Industrial LoRaWAN Wireless Gateway with 5-Port 10/100/1000T (802.11ax 1800Mbps, 2 DI/DO, -40~75 degrees C, US915 Sub 1G)
LCG-300-NR	Industrial LoRaWAN 5G NR Cellular Gateway with 5-Port 10/100/1000T (2 DI/DO, -40~75 degrees C, EU868 Sub 1G)
LCG-300-NR	Industrial LoRaWAN 5G NR Cellular Gateway with 5-Port 10/100/1000T (2 DI/DO, -40~75 degrees C, US915 Sub 1G)
LN1130	Industrial IP30 LoRa Node Controller (Modbus RS232, RS485, EU868/US915 Sub 1G)
LN1140	Industrial IP30 LoRa Node Controller (2 DI, 2 DO, EU868/US915 Sub 1G)

FC C€