InHand Networks

Embrace edge computing to empower industrial digitization



IG502 Series Cost-effective Edge Gateway

- Multiple Access
- Rich Interfaces
- Built-in DSA
- Cloud Management

1. Product Overview

IG502 is a compact and cost-effective industrial edge gateway for global cellular connectivity, protocol conversion, and cloud-managed remote operations.

Key features:

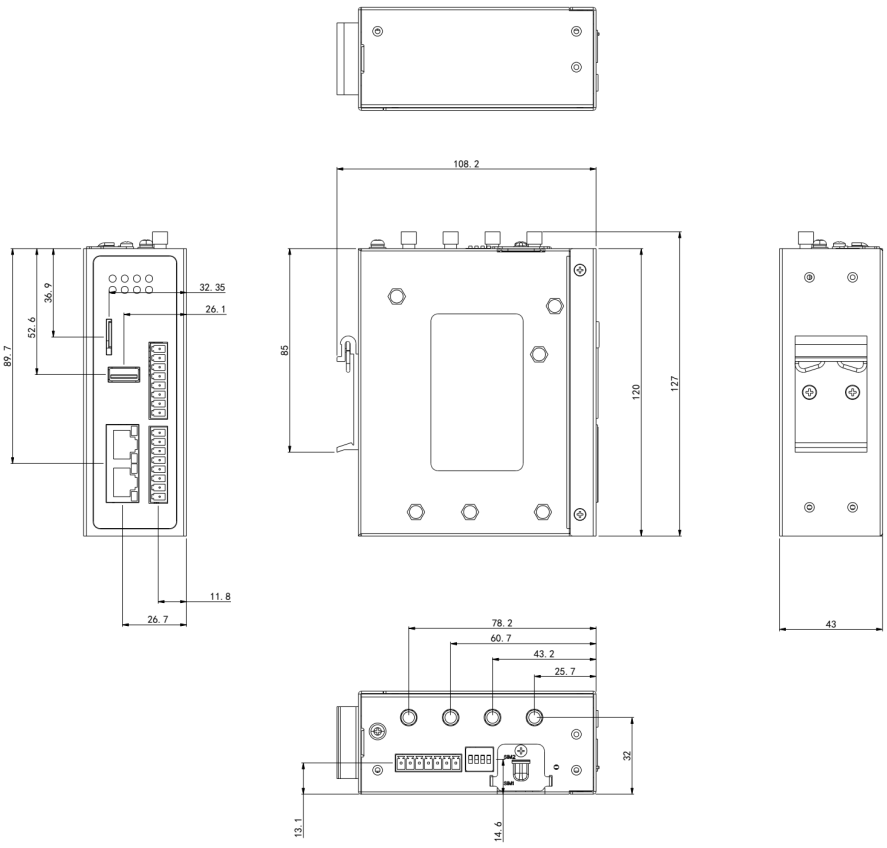
- **Flexible connectivity:** Supports cellular, Ethernet, Wi-Fi backup, and dual-SIM failover
- **Industrial interfaces:** 2×FE, serial, USB, microSD, optional DI/DO and GPS/Wi-Fi/BLE
- **Edge intelligence:** Python secondary development with built-in DSA service
- **Reliable design:** Hardware/software watchdog and multi-level link self-healing
- **Cloud operations:** DeviceLive remote access, batch management, and DSA lifecycle control

Core Technical Specifications

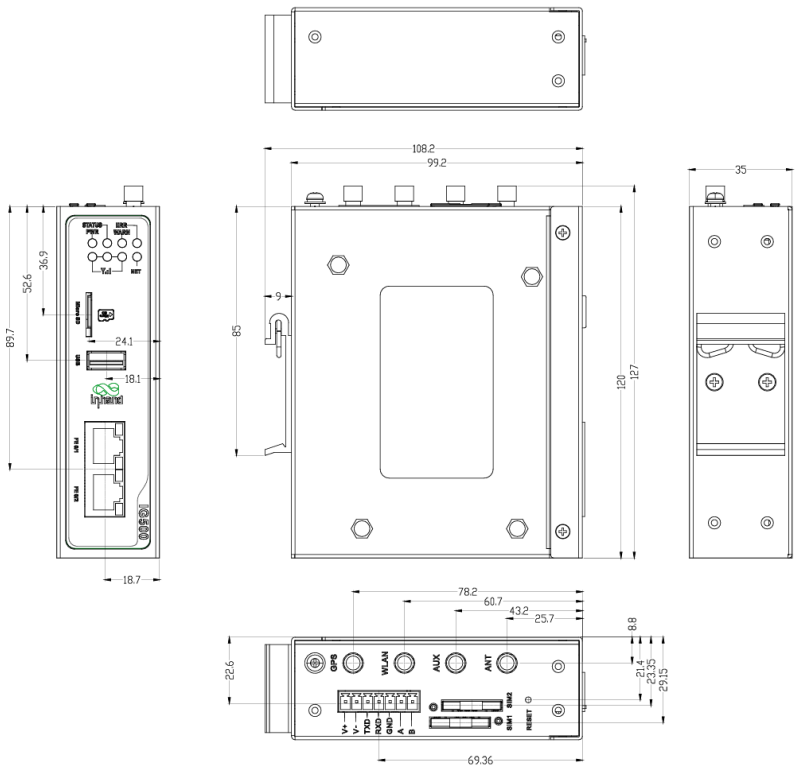
Specification Item	Value
Cellular Network	5G SA/NSA (China models) and LTE Cat.1/Cat.4 (model dependent)
Network Features	APN, VPDN, CHAP/PAP; Static IP/DHCP; ICMP, DNS, TCP/UDP, TCP Server, static routing
Security	Multi-level user permissions, firewall, OpenVPN, IPsec VPN
Cloud Management	DeviceLive remote access, batch operations, and remote upgrades
Secondary Development	Python development environment
Industrial Protocols	Modbus RTU/TCP, OPC UA, EtherNet/IP, IEC101/104, DNP3.0, etc.

Specification Item	Value
Dimensions (W × D × H)	110 × 127 × 35 mm (4.33 × 5 × 1.38 in)
Weight	420 g (0.93 lb)
Ethernet Ports	2 × 10/100 Mbps
Serial Interfaces	1 × RS-232 + 1 × RS-485, or 2 × RS-485 (model dependent)
Power Supply	12~48V DC, industrial terminal block
Operating Temperature & Protection	Models with Wi-Fi: -20 °C ~ 70 °C (-4 °F ~ 158 °F) Models without Wi-Fi: -40 °C ~ 70 °C (-40 °F ~ 158 °F), IP30

2. Product Dimensions & Terminal Definition



Dimension Diagram (With I/O)



Dimension Diagram (Without I/O)

Note:

1. All dimensions are in millimeters (mm), with inches (in) in parentheses.
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.

7 PIN Definition

PIN	Definition	Description
1	V+	Positive electrode
2	V-	Negative electrode
3	TXD or 1A	Serial RS-232 send or RS-485+
4	RXD or 1B	Serial RS-232 receive or RS-485-
5	GND	Serial RS-232 signal ground

6	A or 2A	Serial RS-485+
7	B or 2B	Serial RS-485-

I/O Definition

PIN	Definition	Description
1	PCOM	Dry contact access point
2	DGND	Dry contact ground point
3	DICOM	Digital input common port
4	DI0	Digital/pulse input port 0
5	DI1	Digital/pulse input port 1
6	DI2	Digital/pulse input port 2
7	DI3	Digital/pulse input port 3
8	NC	None
9	DO0	Digital/pulse output port 0
10	DGND	Digital ground
11	DO1	Digital/pulse output port 1
12	DGND	Digital ground
13	DO2	Digital/pulse output port 2
14	DGND	Digital ground
15	DO3	Digital/pulse output port 3
16	DGND	Digital ground

DI input specs:

- 4x Digital/pulse input DI,
- 2x Dry contact control port,
- 1x Common port, 1x Idle,
- Dry contact status "1": closed
- Dry contact status "0": disconnected
- Wet contact status "1": +10 ~ +30V/-30 ~ - 10VDC
- Wet contact status "0": 0 ~ +3V/-3 ~ 0V
- Isolation 3000VDC
- Pulse signal counter supported
- Supports up to 100Hz pulse signal (32-bit counter +1-bit overflow mark)

DO output specs:

- 3x Digital/pulse output DO
- 1x Digital output
- 4x Digital ground
- Isolation: 3000VDC

3. Hardware Specifications

Category/Parameter	Specification
CPU and Storage	
CPU	ARM Cortex-A8 @600MHz
RAM	512MB
Flash	8GB eMMC
Connectivity and Interfaces	
Ethernet Ports	2×10/100 Mbps Ethernet
I/O Ports	Up to 4×DI + 4×DO (optional) (isolated)
Serial Ports	1×RS-232 + 1×RS-485, or 2×RS-485, industrial terminal block, ordering guide for details

Category/Parameter	Specification
SIM Card Slot	Dual Micro SIM
Antenna Connectors	LTE：SMA x 1, Wi-Fi：SMA x 1, GNSS：SMA x 1, Note: North America models: 2 x SMA 4G antenna connectors.
USB	USB2.0 Type-A
microSD	microSD up to 32GB
Wi-Fi(optional)	Wi-Fi STA 802.11 b/g/n 2.4G
Bluetooth(optional)	BLE4.2 (optional)
GNSS(optional)	Satellite location GPS
Power and Power Consumption	
Input Voltage	12~48V DC input
Power Interface	Industrial terminal block
Power	250mA@12V
Mechanical Specifications	
Product Dimensions	110 × 127 × 35 mm (4.33 × 5 × 1.38 in)
Product Weight	420 g (0.93 lb)
Mounting Method	Panel, DIN-rail mounting
Protection Rating	IP30
Housing and Cooling	Fanless metal housing
RTC	Support (button battery backup)

Category/Parameter	Specification
Hardware Watchdog	support
Environment and Certifications	
Storage Temperature	-40 °C ~ 85 °C (-40 °F ~ 185 °F)
Operating Temperature	Models with Wi-Fi: -20 °C ~ 70 °C (-4 °F ~ 158 °F) Models without Wi-Fi: -40 °C ~ 70 °C (-40 °F ~ 158 °F)
Ambient Humidity	5~95% RH non-condensing
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, UKCA, FCC, PTCRB, UL, C1D2 (Class1 Division 2), MIC&JATE, VerizonWireless, AT&T, IC, RCM, NBTC, ANATEL, IEC62443-4-2, IEC61850-3

4. Software Specifications

Category/Parameter	Specification
Operating System	Custom Linux

Category/Parameter	Specification
Network Features	
Network Access	APN, VPDN
Access Authentication	CHAP/PAP
Network Types/Standards	5G SA/NSA and LTE Cat.1/Cat.4 by model
WAN Protocols	Static IP, DHCP
LAN Protocols	ARP, Ethernet
IP Applications	ICMP, DNS, TCP/UDP, TCP Server, DHCP
IP Routing	Static routing
Security	
User Management	Multi-level user permissions
Network Security	Firewall
Data Security	OpenVPN, IPsec VPN
Reliability	
Link Detection	Sends heartbeat packets to detect, auto redials when disconnected
Embedded Watchdog	Embedded watchdog auto-recovery
Dual-SIM Switching	Dual-SIM failover
Open Platform and Data Acquisition Protocols (DSA)	

Category/Parameter	Specification
Development Environment	Python development environment
Cloud Integration	AWS, Azure, AliCloud and other cloud platforms
Industrial Protocols	Modbus RTU/TCP, EtherNet/IP, ISO on TCP, OPC UA, Mitsubishi MC/CPU Port, FINSUDP, HostLink, PPI
Electricity Protocol	DLT645-2007, IEC101/104, DNP3.0, IEC61850-MMS
Other Protocols	BACnet, CNC
Network Management	
Configuration	Web/Telnet/SSH configuration
Upgrade	Web/DeviceLive upgrade
Log	Support local system logs, remote logs, and important log power-off preservation
Configuration Backup	Config import/export
Remote Management	DeviceLive/HTTP/HTTPS/SSH remote management

5. Ordering Information

Model Rule

Model code: IG502-<WMNN>-<S>-<IO/NA>-<W/NA>-<G/NA>[-TH]

<WMNN>: Cellular Type & Frequency Band (or EN00 for no cellular)
<S>: Serial option (`S` =RS-232×1+RS-485×1, `D485` =RS-485×2)
<IO/NA>: DI/DO option (`IO` =4DI+4DO)
<W/NA>: WLAN & BLE option
<G/NA>: GPS option
[-TH]: Thailand regional variant (for specific FQ58 models)

Model List

Model	Region	<WMNN>	<S>	<IO/NA>	<W/NA>	<G/NA>
IG502-LQA3	China	Cat.1; LTE-FDD B1/B3/B5/B8; LTE-TDD B34/B38/B39/B40/B41; GSM 900/1800	S	NA	NA	NA
IG502-LQA3-IO	China	Cat.1; LTE-FDD B1/B3/B5/B8; LTE-TDD B34/B38/B39/B40/B41; GSM 900/1800	S	IO	NA	NA
IG502-LQA3-W-G	China	Cat.1; LTE-FDD B1/B3/B5/B8; LTE-TDD B34/B38/B39/B40/B41; GSM 900/1800	S	NA	W	G
IG502-LQA3-IO-W-G	China	Cat.1; LTE-FDD B1/B3/B5/B8; LTE-TDD B34/B38/B39/B40/B41; GSM 900/1800	S	IO	W	G
IG502-LQA3-D485	China	Cat.1; LTE-FDD B1/B3/B5/B8; LTE-TDD B34/B38/B39/B40/B41; GSM 900/1800	D485	NA	NA	NA
IG502-LQA3-D485-IO	China	Cat.1; LTE-FDD B1/B3/B5/B8; LTE-TDD B34/B38/B39/B40/B41; GSM 900/1800	D485	IO	NA	NA
IG502-LQA3-D485-W-G	China	Cat.1; LTE-FDD B1/B3/B5/B8; LTE-TDD B34/B38/B39/B40/B41; GSM 900/1800	D485	NA	W	G
IG502-LQA3-D485-IO-W-G	China	Cat.1; LTE-FDD B1/B3/B5/B8; LTE-TDD B34/B38/B39/B40/B41; GSM 900/1800	D485	IO	W	G
IG502-NRQ1	China	5G NR NSA n41/n78/n79; SA n1/n28/n41/n77/n78/n79; LTE-FDD B1/B3/B5/B8; LTE-TDD B34/B38/B39/B40/B41; WCDMA B1/B5/B8	S	NA	NA	NA

IG502-NRQ1-D485	China	5G NR NSA n41/n78/n79; SA n1/n28/n41/n77/n78/n79; LTE-FDD B1/B3/B5/B8; LTE-TDD B34/B38/B39/B40/B41; WCDMA B1/B5/B8	D485	NA	NA	NA
IG502-FQ33	North America	Cat.1; LTE-FDD B2/B4/B5/B12/B13/B25/B26; WCDMA B2/B4/B5	S	NA	NA	NA
IG502-FQ33-IO	North America	Cat.1; LTE-FDD B2/B4/B5/B12/B13/B25/B26; WCDMA B2/B4/B5	S	IO	NA	NA
IG502-FQ33-W-G	North America	Cat.1; LTE-FDD B2/B4/B5/B12/B13/B25/B26; WCDMA B2/B4/B5	S	NA	W	G
IG502-FQ33-IO-W-G	North America	Cat.1; LTE-FDD B2/B4/B5/B12/B13/B25/B26; WCDMA B2/B4/B5	S	IO	W	G
IG502-FQ33-D485-IO-W-G	North America	Cat.1; LTE-FDD B2/B4/B5/B12/B13/B25/B26; WCDMA B2/B4/B5	D485	IO	W	G
IG502-FF53	EMEA	Cat.1; LTE-FDD B1/B3/B7/B8/B20/B28; GSM/GPRS/EDGE B3/B8	S	NA	NA	NA
IG502-FF53-IO	EMEA	Cat.1; LTE-FDD B1/B3/B7/B8/B20/B28; GSM/GPRS/EDGE B3/B8	S	IO	NA	NA
IG502-FF53-W-G	EMEA	Cat.1; LTE-FDD B1/B3/B7/B8/B20/B28; GSM/GPRS/EDGE B3/B8	S	NA	W	G
IG502-FF53-IO-W-G	EMEA	Cat.1; LTE-FDD B1/B3/B7/B8/B20/B28; GSM/GPRS/EDGE B3/B8	S	IO	W	G
IG502-FF53-D485-IO-W-G	EMEA	Cat.1; LTE-FDD B1/B3/B7/B8/B20/B28; GSM/GPRS/EDGE B3/B8	D485	IO	W	G
IG502-FQ58	EMEA&APAC	Cat.4; LTE-FDD B1/B3/B7/B8/B20/B28A; LTE-TDD B38/B40/B41; WCDMA B1/B8; GSM B3/B8	S	NA	NA	NA
IG502-FQ58-IO	EMEA&APAC	Cat.4; LTE-FDD B1/B3/B7/B8/B20/B28A; LTE-TDD B38/B40/B41; WCDMA B1/B8; GSM B3/B8	S	IO	NA	NA

IG502-FQ58-W-G	EMEA&APAC	Cat.4; LTE-FDD B1/B3/B7/B8/B20/B28A; LTE-TDD B38/B40/B41; WCDMA B1/B8; GSM B3/B8	S	NA	W	G
IG502-FQ58-IO-W-G	EMEA&APAC	Cat.4; LTE-FDD B1/B3/B7/B8/B20/B28A; LTE-TDD B38/B40/B41; WCDMA B1/B8; GSM B3/B8	S	IO	W	G
IG502-FQ58-D485-IO-W-G	EMEA&APAC	Cat.4; LTE-FDD B1/B3/B7/B8/B20/B28A; LTE-TDD B38/B40/B41; WCDMA B1/B8; GSM B3/B8	D485	IO	W	G
IG502-FQ58-TH	Thailand	Cat.4; LTE-FDD B1/B3/B7/B8/B20/B28A; LTE-TDD B38/B40/B41; WCDMA B1/B8; GSM B3/B8	S	NA	NA	NA
IG502-FQ58-IO-TH	Thailand	Cat.4; LTE-FDD B1/B3/B7/B8/B20/B28A; LTE-TDD B38/B40/B41; WCDMA B1/B8; GSM B3/B8	S	IO	NA	NA
IG502-FQ58-IO-W-G-TH	Thailand	Cat.4; LTE-FDD B1/B3/B7/B8/B20/B28A; LTE-TDD B38/B40/B41; WCDMA B1/B8; GSM B3/B8	S	IO	W	G
IG502-FQ58-D485-IO-W-G-TH	Thailand	Cat.4; LTE-FDD B1/B3/B7/B8/B20/B28A; LTE-TDD B38/B40/B41; WCDMA B1/B8; GSM B3/B8	D485	IO	W	G
IG502-FQ78	Australia & Latin America	Cat.4; LTE-FDD B1/B2/B3/B4/B5/B7/B8/B28; LTE-TDD B40; UMTS B1/B2/B5/B8; GSM 850/900/1800/1900	S	NA	NA	NA
IG502-FQ78-IO	Australia & Latin America	Cat.4; LTE-FDD B1/B2/B3/B4/B5/B7/B8/B28; LTE-TDD B40; UMTS B1/B2/B5/B8; GSM 850/900/1800/1900	S	IO	NA	NA
IG502-FQ78-W-G	Australia & Latin America	Cat.4; LTE-FDD B1/B2/B3/B4/B5/B7/B8/B28; LTE-TDD B40; UMTS B1/B2/B5/B8; GSM 850/900/1800/1900	S	NA	W	G
IG502-FQ78-IO-W-G	Australia & Latin America	Cat.4; LTE-FDD B1/B2/B3/B4/B5/B7/B8/B28; LTE-TDD B40; UMTS B1/B2/B5/B8; GSM 850/900/1800/1900	S	IO	W	G
IG502-FQ78-D485-IO-W-G	Australia & Latin America	Cat.4; LTE-FDD B1/B2/B3/B4/B5/B7/B8/B28; LTE-TDD B40; UMTS B1/B2/B5/B8; GSM 850/900/1800/1900	D485	IO	W	G

IG502-EN00	Global (No Cellular)	No cellular	S	NA	NA	NA
IG502-EN00-IO	Global (No Cellular)	No cellular	S	IO	NA	NA
IG502-EN00-W-G	Global (No Cellular)	No cellular	S	NA	W	G
IG502-EN00-IO-W-G	Global (No Cellular)	No cellular	S	IO	W	G
IG502-EN00-D485-IO-W-G	Global (No Cellular)	No cellular	D485	IO	W	G

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