InHand Networks

Powerful Computing, Multiple Industrial Protocols,
Fast Python Customization

InGateway902 Series

Industrial Edge Computing Gateway

The new IIoT edge computing gateway provides uninterrupted Internet access for machines over ubiquitous 3G/4G wireless networks and multiple broadband services. With powerful edge computing capabilities, comprehensive security protection and wireless services, InGateway902 can support device networking of up to 10,000 levels, providing high-speed data channels in the true sense of device informatization.
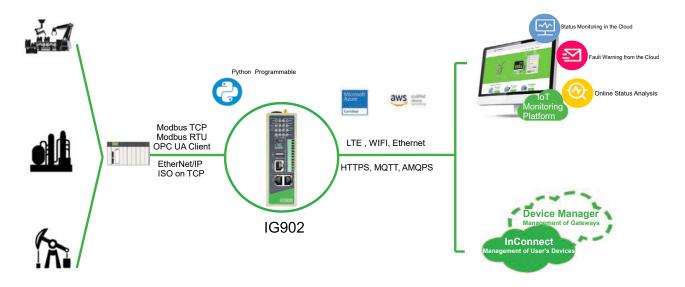
InGateway902 features powerful edge computing capabilities. It realizes data optimization, real-time response, agile connection and intelligent analysis on the IoT edge, significantly reduces the data flow between field sites and data center, and avoid bottlenecks of cloud-end computing.

The edge computing gateway IG902 will help customers to optimize network architecture, enable more secure, responsive, and intelligent services on manufacturing sites.

IG902 edge computing gateway is ideal for networking machines on distributed IIoT sites and aggregating data to cloud-end applications, e.g.:

- Industrial equipment intelligence
  - Industrial robot
  - CNC machine
  - Air compressor
  - HVAC system
  - Packaging, food, medicine manufacturing machineries
- Automated production line
- Energy: Oil & Gas, distributed PV, wind turbine
- Public utilities: heating, water, natural gas
- Smart agriculture, etc.

Application Case

Features and Advantages

+ Supports 4G LTE CAT4, CAT1 and Ethernet
+ Built-in redundancies: dual SIM card, link backup, VRRP hot standby, ensuring uninterrupted network communications
+ Powerful computing performance, providing high-performance processing resources for edge computing
+ Supports a variety of industrial real-time Ethernet protocols and field bus protocols, compatible with a wide range of industrial equipment
+ Supports Python development, for developing user custom applications
+ Supports Docker container technology
+ Supports industrial cloud platforms: Microsoft Azure, Amazon AWS
+ Easy for management and large-scale deployment, supports SNMP protocol and InHand Device Manager cloud platform for efficient remote central management
+ Fully industrial-grade design, ready for challenging conditions

- **Uninterrupted Internet access from anywhere**
  Multiple WAN links: fast Ethernet, 3G/4G, multiple DSLs. Wherever the device is, it can be connected easily. Customers can choose LTE CAT4 (downlink/uplink: 150Mbps/50Mbps) or CAT1 (downlink/uplink: 10Mbps/5Mbps) standard network services.

- **Powerful edge computing, adapting intelligent edge processing of different industries**
  ARM Cortex-A8 processor, 1GHz CPU, up to 1GB DDR3 RAM and 8GB eMMC FLASH, the gateway owns powerful computing capabilities for data optimization, real-time response, agile connection, intelligent analysis and other data processing on the IoT edge.

- **Multiple industrial real-time Ethernet protocols and fieldbuses**
  In order to be compatible with the broadly diversified industrial controllers in the market, the edge gateway supports these protocols: Modbus TCP, Modbus RTU, OPC UA Client, EtherNet/IP, ISO on TCP, etc.

- **Python customization development platform**
  The InGateway900 is embedded with the Python development platform, so that customers can custom develop applications to meet own service requirements. While with the integrated SDK and APPs provided by InHand, customers can access the system APIs and other resources easily, completing custom development in shorter time to market.

- **Multiple industrial cloud ecosystems**
  InHand has become the partner of Microsoft and Amazon. The edge gateway supports Microsoft AZURE, Amazon AWS and Schneider EcoStruxure industrial cloud platforms. InHand will keep working for the development of IIoT cloud ecosystem.

- **Complete security protection**
  Complete security protection covers user authorization and authentication, network security, and data transmission security.

- **High reliability design**
  - Link redundancy: dual-SIM, link backup, VRRP, for continuous transmission during network failure
  - Link detection: multiple detection mechanisms, auto redial to maintain persistent connection
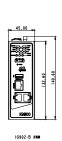 - Fault recovery: Soft & hardware watchdog, self recovers from faults for high device availability

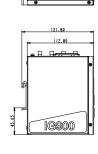- **Supports large-scale deployment**
  In large-scale IIoT applications, tens of thousands of gateways are to be deployed for the networking of machines. The gateway supports SNMP and Device Manager network management to help with effective device management and deployment.

- **Fully industrial-grade design**
  From processor chip, memory chip to communication module and power terminal, the product adopts strict industrial grade standards, meeting industrial grade on indexes like EMC level 3, IP30, and wide operating temperatures. Solid and durable, ready for the challenging conditions of industrial sites.
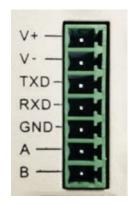
Dimensions (mm)

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Interface Definitions

7PIN Interface Definition		
Pin	Definition	Description
1	V+	Positive electrode
2	V-	Negative electrode
3	TXD	Serial RS232 send
4	RXD	Serial RS232 receive
5	GND	Serial RS232 signal ground
6	A	Serial RS485+
7	B	Serial RS485-

Power/Serial Port Terminal

I/O Definition			
Pin	Definition	Description	
1	DI0	Digital input port 0	4-channel digital input DI Status "1": +10~+30V Status "0": 0~+3V
2	DI1	Digital input port 1	
3	DI2	Digital input port 2	
4	DI3	Digital input port 3	
5	COM0	Common port	
6	DO0	Digital output port 0	2-channel digital output DO Max load 5A@30VDC or 250VAC
7	DO1	Digital output port 1	
8	COM1	Common port	
9	AI0+	Analog input positive port 0	2-channel analog input AI Current signal supported: 0-20mA, 4-20mA Voltage signal supported: 0-5VDC, 0-10VDC Choose 1 out of the above 4 ranges
10	AI0-	Analog input negative port 0	
11	AI1+	Analog input positive port 1	
12	AI1-	Analog input negative port 1	

I/O Terminal

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Product Specifications

IG902 Hardware Specifications		
Item	IG902-B (Basic Version)	IG902-H (High-config Version)
Hardware Platform		
CPU	ARM Cortex-A8 1GHz	
RAM	512MB DDR3	1GB DDR3
FLASH	8GB eMMC	
Interfaces		
Ethernet Port	2*10/100/1000Mbps fast Ethernet ports, WAN/LAN or 2*LAN	
Industrial Serial Port	RS-232 x 1, RS-485 x 1;	
	RS-232 signal: TXD, RXD, GND; RS-485 signal: A, B, GND	
	ESD protection: 15KV	
I/O	No	4-channel digital input DI Status "1": +10~+30V Status "0": 0~+3V
		2-channel digital output DO Max load 5A@30VDC or 250VAC
		2-channel analog input AI Current signal supported: 0-20mA, 4-20mA Voltage signal supported: 0-5VDC, 0-10VDC Choose 1 out of the above 4 ranges
Console Port	RS-232 x 1, RJ-45 interface	**Wi-Fi (Optional)** 2.4G or 5G (802.11 ac/a/b/g/n)
USB	1 x USB 2.0 port	**Reset Button** Pinhole button
SIM Card Slot	1.8V/3V, drawer-type slot x 2	**MircoSD Expansion** Up to 32GB
GPS (Optional)	Satellite positioning GPS: SMA x 1	
Mechanical Features		
Installation	DIN-rail, wall mounting	**Protection Rating** IP30
Housing	Metallic structure	**Cooling** Fan-less cooling
Power Supply		
Power Input	DC12-48V	**Polarity Reverse & Overcurrent Protection** Supported
Power Terminal	Unpluggable industrial terminal connection	
Ambient Temperature and Humidity		
Storage Temp.	-40 ~ 85°C	**Working Temp.** -25 ~ 70°C
Ambient Humidity	5 ~ 95% (non-condensing)	
Others		
Real-time Clock (Optional)	Embedded real time clock (RTC), powered by super capacitor	
Indicators		
LED	POWER, STATUS, WARN, ERROR, MODEM, SIM1, SIM2, TF (card), PYTHON, USER1, USER2, WIFI, GPS, SIGNAL	
EMC Index		
Static	EN61000-4-2, level 3	**Surge** EN61000-4-5, level 3
Radiation Electric Field	EN61000-4-3, level 3	**Conducted Disturbance** EN61000-4-6, level 3
Pulse Electric Field	EN61000-4-4, level 3	**Shockwave Immunity** EN61000-4-12, level 3
Power Frequency Magnetic Field	EN61000-4-8, horizontal / vertical 400A/m (>level 3)	
Physical Features		
Shockproof	IEC60068-2-27	**Vibration** IEC60068-2-6
Free Fall	IEC60068-2-32	
Certification		
CE, FCC, PTCRB, IMDA, MIC, KC		

IG902 Software Specifications	
Item	IG902
Network Interconnection	
Network Access	APN, VPDN
Access Authentication	CHAP/PAP/MS-CHAP/MS-CHAPV2
Network Type	LTE, WCDMA(HSPA+) EDGE, GPRS, CDMA
LAN Protocol	ARP, EtherNet
Network Protocols	
IP Application	Ping, Traceroute, DHCP Server/Relay/Client, DNS Relay, DDNS, Telnet, SSH, HTTP, HTTPS, TFTP, FTP, SFTP
IP Routing	Static Routing
Network Security	
Firewalls	Stateful packet inspection (SPI), anti-DoS attack
	Multicast/Ping filter, Access Control List (ACL)
	NAT, PAT, DMZ, port mapping, virtual server
User Levels	Multi-level user authorization
AAA	Local authentication, Radius, Tacacs+, LDAP
Data Security	IPsec VPN, OPENVPN, CA (may auto apply)
Reliability	
Backup	VRRP, interface backup, dual-SIM backup
Link Detection	Heartbeat packet detection, auto-recovery of disconnection
Embedded Watchdog	Device self-diagnosis, auto-recovery from operation faults
WLAN (Optional)	
Standard	IEEE 802.11ac/a/b/g/n
Security	Open System, Shared Key, WPA/WPA2 certification, WEP/TKIP/AES encryption
Mode	AP, Client modes
Network Management	
Configuration Method	Local or remote HTTP, HTTPS, Telnet, SSH
Upgrade Method	Local or remote WEB, DM, TFTP, FTP, SFTP server
Log	Local or remote log export, power-down log saving
SMS	Status enquiry, configuration, and reboot
Dial On-demand	Activated by data, activated by SMS, scheduled online/offline
Network Management	SNMP v1/v2c/v3, InHand MIBs
InHand DM	Centralized management, batch configuration
Network Disgnostics	Ping, Traceroute, Sniffer (network packet capture tool)
Development Platform	
Development Platforms	Python customization development; Microsoft Azure, Amazon AWS, Schneider EcoStruxure, InHand DN cloud platform
Industrial Protocols	
Protocols (Basic Version)	Modbus RTU, Modbus TCP, OPC UA Client, EtherNET/IP, ISO on TCP
Protocols (High-config Version)	Modbus RTU, Modbus TCP, OPC UA Client, EtherNET/IP, ISO on TCP

Ordering Guide

Model	Version: <B/H>	Region (Operator)	Cellular Type & Module: <WMNN>		I/O Interface: (H version only) <IO/NA>	WLAN: <W/NA>	GPS: <G/NA>
Model code: IG902-<B/H>-<WMNN>-<IO/NA>(H version only)-<W/NA>-<G/NA>			Network Type	Band & Frequency			
IG902-<B/H>-TL00-<IO/NA>-<W/NA>-<G/NA>	B: Basic H: High-config	China	LTE CAT4	LTE-FDD Band 1/3/8 LTE-TDD Band 38/39/40/41 TD-SCDMA Band 34/39 UMTS（DC-HSPA+）Band 1/5 EDGE/GPRS/GSM 850/900/1800/1900MHz	IO: I/O <NA>: no I/O	W: Wi-Fi <NA>: no Wi-Fi	G: GPS <NA>: no GPS
IG902-<B/H>-FH20-<IO/NA>-<W/NA>-<G/NA>	B: Basic H: High-config	Europe & APAC	LTE CAT4	LTE-FDD Band 1/2/3/4/5/7/8/20 UMTS(DC-HSPA+) Band1/2/5/8 EDGE/GPRS/GSM 850/900/1800/1900MHz	IO: I/O <NA>: no I/O	W: Wi-Fi <NA>: no Wi-Fi	G: GPS <NA>: no GPS
IG902-<B/H>-FS39-<IO/NA>-<W/NA>-<G/NA>	B: Basic H: High-config	North America	LTE CAT6	LTE-FDD Band 2/4/5/12/17/13/29 UMTS(DC-HSPA+) Band 2/4/5 EDGE/GPRS/GSM 850/900/1800/1900MHz	IO: I/O <NA>: no I/O	W: Wi-Fi <NA>: no Wi-Fi	G: GPS <NA>: no GPS
IG902-<B/H>-FQ78-<IO/NA>-<W/NA>-<G/NA>	B: Basic H: High-config	Australia, New Zealand and Latin America	LTE CAT4	LTE-FDD Band 1/2/3/4/5/7/8/28 LTE-TDD B40 UMTS(DC-HSPA+) Band1/2/5/8 EDGE/GPRS/GSM 850/900/1800/1900MHz	IO: I/O <NA>: no I/O	W: Wi-Fi <NA>: no Wi-Fi	G: GPS <NA>: no GPS
IG902-<B/H>-FQ88-<IO/NA>-<W/NA>-<G/NA>	B: Basic H: High-config	Japan	LTE CAT4	LTE FDD Band 1/3/8/18/19/26 LTE TDD Band 41 WCDMA Band 1/6/8/19	IO: I/O <NA>: no I/O	W: Wi-Fi <NA>: no Wi-Fi	G: GPS <NA>: no GPS
IG902-<B/H>-FQ98-<IO/NA>-<W/NA>-<G/NA>	B: Basic H: High-config	South Korea	LTE CAT4	LTE FDD Band 1/3/5/7/8/20 LTE TDD Band 38/40/41 WCDMA Band 1/5/8 EDGE/GSM Band 3/8	IO: I/O <NA>: no I/O	W: Wi-Fi <NA>: no Wi-Fi	G: GPS <NA>: no GPS
IG902-<B/H>-EN00-<IO/NA>-<W/NA>-<G/NA>	B: Basic H: High-config	Global	-	No 3G/4G communication module	IO: I/O <NA>: no I/O	W: Wi-Fi <NA>: no Wi-Fi	G: GPS <NA>: no GPS
Example:	IG902-H-FH20-IO-W-G:IG902 high-config. version, supports Europe and Asia-Pacific LTE CAT4 networks, supports I/O interface, supports Wi-Fi and GPS						

About Us

InHand Networks is a global leader of Industrial IoT, with a record of tremendous success following groundbreaking innovation since our inception in 2001.

InHand serves world-class partners and customers with industrial M2M routers, gateways, industrial Ethernet switches, rugged computers and IoT management platforms. We provide IoT solutions for various vertical markets including Smart Grid, Industrial Automation, Remote Machine Monitoring, Smart Vending, Smart City, Retail and more.

Proudly bearing the marks of both Rockwell Automation Encompass Product Partner in Asia-Pacific and Schneider Electric CAPP Technology Partner, InHand Networks defines industrial innovation and reliability.

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