InHand Networks

Reliable, Secure, Large-scale M2M/IoT Deployment

InRouter900 Series

Industrial LTE Router

IR900 series high industrial grade router is a new generation of 3G/4G wireless VPN router launched by InHand networks for the industrial field. With its comprehensive security and wireless services, it can realize up to 10,000-level equipment networking to provide high-speed data access for equipment information in the true sense.

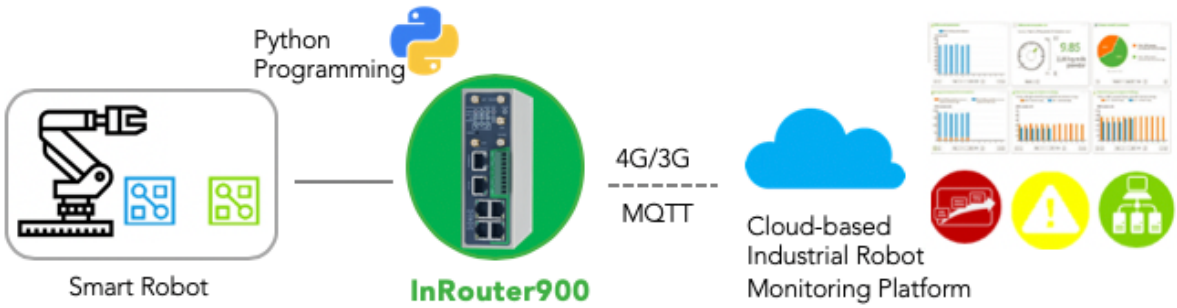
Featuring industrial-grade design, 4G/3G connectivity and intelligent software functions, the InRouter900 is a full-featured LTE router developed for mission critical IIoT applications. With dual SIM, VRRP and VPN, the InRouter900 provides best-in-class reliability and security protection for remote devices, helping enterprise customers to achieve efficient large-scale deployment and management. It is a certified Microsoft Azure IoT Device.

The InRouter900 supports Python programming which can greatly facilitate custom IoT development with shorten time to market. R900 series routers are brilliant in the wave of equipment information construction because of their excellent hardware performance, easy deployment and perfect remote management function.

The InRouter 900 is ideal for large scale mission-critical industrial applications, such as:

- Smart manufacturing
- Industrial automation
- Smart grid
- Smart Medical
- Smart transportation
- Security
- Oil & Gas
- Industrial Robots
- Field big data
- Agriculture
- Water & Wastewater
- Digital manufacture devices

Application Case



Features and Advantages

- Global 4G LTE
- Multi-carrier Certified
- Large Scale Deployment
- Dual SIM Redundancy
- Automatic Link Detection & Recovery
- VRRP
- VLAN
- WLAN
- GPS
- Remote Management via SNMP and InHand *Device Manager*
- User experience plan, enjoy efficient and convenient service
- Python Programming
- Azure IoT Certified
- Ruggedized for Harsh Environments

- **Uninterrupted Internet Access Anytime Anywhere**

  Provide fast LTE wide area network links to achieve business continuity and wide area network diversity. No matter where the equipment is located, you can choose 3G/4G network with wide global coverage to ensure the interconnection and intercommunication of the equipment.Available with LTE CAT 4 (downlink 150Mbps, uplink 50Mbps) and LTE CAT 1 (downlink 10Mbps, uplink 5Mbps), support Wi-Fi (AP/Client).

- **Support Python Programming**

  Use pre-installed Python SDK to access APIs and other resources and develop customized Python (2.7) programs. InHand networks provides an integrated programming development environment (SDK), which can easily call various interfaces and resources of the system. Customers can embed special programs according to production business to provide core value for customers

- **Support Large Scale Deployment**

  Easy remote management via Web, CLI and etc. It is convenient for enterprise network managers to quickly configure thousands of routers and efficiently manage the remote centralized network. Enjoy efficient and convenient services by joining the user experience program. Support RIP, OSPF, BGPv4 for improved efficiency. Dynamic Multipoint VPN (DMVPN) to greatly reduce the workload to configure thousands of remote devices.

- **Robust Security**

  VPN: L2TP, IPSec VPN, DMVPN, OpenVPN and CA
  Network security: Stateful Packet Inspection (SPI), Access Control List (ACL), anti-DoS attack, intrusion protection, attack protection, IP/MAC binding, etc.
  Device security: AAA (TACACS, Radius local authentication); multi-level user authority

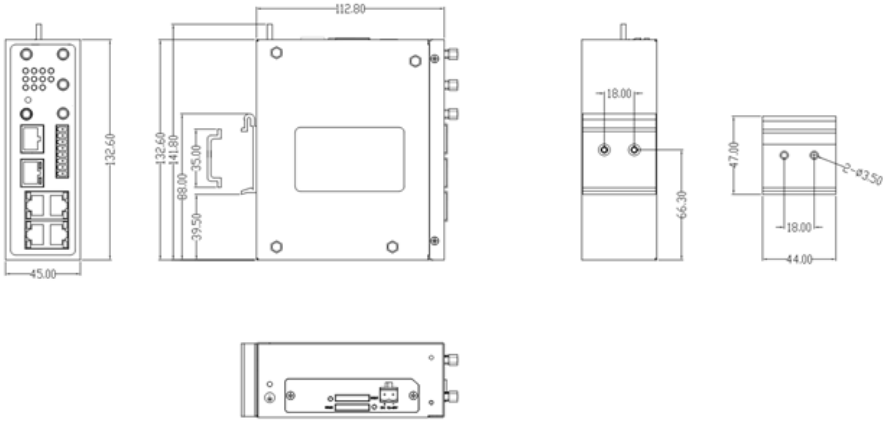
- **High Reliability**

  Redundancy with link backup, VRRP and Dual SIM
  Automatic Link Detection & Recovery:
  - PPP layer: keep connection to operator network, prevent forced hibernation, able to detect stability of dial-up connections
  - Network connection: automatic redial when link broken, keep Long Connection
  - VPN tunnel: sustain VPN tunnel, to ensure availability of business
  InRouter Auto-recovery: InRouter embeds hardware watchdog, able to automatically recover from various failures, ensure highest level of availability

- **InHand Network Operation System: INOS 2.0**

  InHand Network Operation System (INOS) has been built as the highly reliable & real-time basis for all network functions, as well as easy-to-use configuration interface via Web, CLI or SNMP. INOS is in modular design, expandable, and adaptable to various M2M/IoT applications.

Dimensions (mm) and Interfaces



9-pin Industrial Terminal Definition

Pin	Definition	Description
1	RXD	Serial port RS232 data receiving
2	TXD	Serial port RS232 data transmitting
3	GND	Serial port RS232 signal ground
4	A	Serial port RS485+
5	B	Serial port RS485-
6	IN	Digital input signal
7	COM	Digital input ground
8	NC	Digital output signal
9	COM	Digital output ground

Technical Specifications

IR900 Software Specifications	
Network Interface	
Operator Access	APN, VPDN
Access Authentication	CHAP/PAP/MS-CHAP/MS-CHAP V2
Cellular	LTE, WCDMA(HSPA+), EDGE, GPRS
LAN	ARP, Ethernet
WAN	Static IP, DHCP, PPPoE
Protocol	
IP	Ping, Traceroute, DHCP Server/Relay/Client, DNS Relay, Dynamic DNS, Telnet, SSH, HTTP, HTTPS, TFTP, FTP, SFTP
IP Routing	Static Routing, RIP, OSPF, IGMP Proxy, BGP V4
Security	
Firewall	Stateful Packet Inspection (SPI), Anti-DoS Attack
	Filtering Multicast/Ping package, Access Control List (ACL)
	NAT, PAT, DMZ, Port Mapping, Virtual Server
Multi Level Authority	Two level authority: Full Authority and Read-Only User
AAA	Local Authentication, Radius, TACACS+, LDAP
CA Certificate	PEM, PKCS12, SCEP
Data Security	IPsec VPN, L2TP, PPTP, GRE, OPENVPN, DMVPN, CA
Others	Anti-ARP, DMZ, MAC Filtering
Reliability	
Link Backup	Floating Route, WAN Link Backup
Auto-Recover	Various Heartbeat Package, Automatic Recover from Failure
Watchdog	Self-diagnostic, Automatic Recover from Failure
GPS	Port
Support GPS	Support VLAN and Port Mirroring
QoS	
Bandwidth	Limiting maximum bandwidth
Data Priority	Support Protocol-based data control
WLAN	
Standard	IEEE 802.11b/g/n
Security	WPA/WPA2, WPA-PSK, Support Open System, Shared KeyWEP/ TKIP/AES Encryption
Mode	Support both AP and Client Mode
Intelligence	
DTU	TCP, UDP transparent transmission, TCP Server, DC
Bridge	101-104, Modbus RTU -Modbus TCP
Net Management	
Configuration	Configure via HTPP, HTTPS, Serial Port, Telnet, SSH
Firmware Upgrade	WEB, Serial Port, TFTP, FTP, SFTP server, Device Manager
Log	Local sys log, remote lot, export log via Serial Port Important Log Backup in Flash Memory
SMS	SMS to Inquiry Status, Reboot
On-Demand Dial Up	Activate by data, Activate by SMS, Scheduled Online/Offline
SNMP	SNMP v1/v2c/v3, InHand MIBs
DM	Remote management via InHand Device Manager (DM)
AAA	Local/Radius/TACACS+/LDAP
Multilevel Authority	Multiple Levels of User Authority
Diagnostic	Ping, Traceroute, Snifffer

IR900 Hardware Specifications			
Item	IR912	IR915	
Hardware			
CPU	ARM Cortex-A8 600MHz	ARM Cortex-A8 600MHz	
Memory	128MB	128MB	
FLASH	128MB	128MB	
Interface			
Ethernet Ports	2* 10/100Mbps, WAN/ LAN	5*10/100Mbps, WAN/LAN; support VLAN	
Serial Port	N/A	2 Serial: RS232 x1, RS485 x1 RS-232 signal: TXD, RXD, GND RS-485 signal: A, B, GND ESD Protection: 15KV	
Console	RS-232 x1, RJ45 Serial Port	SIM Holder	2 Push-type SIM Card Holders
Reset	Pinhole Reset Button	Ground Terminal	Spport
Wi-Fi	N/A	Optional 802.11b/g/n	
Antenna	3G/4G: SMA Female Connector x 2	3G/4G: SMA Female Connector x 2, WLAN: RP-SMA x 1	
DI/DO (IR915 only)	N/A	1*DI, galvanic isolation, Status “1”:+10~+30V Status “0”:-30~+3V” 1 relay output, 2A@30VDC	
GPS (optional)	N/A	GPS: SMA x 1	
Mechanical			
Installation	Din-ail, wall mount	IP Level	IP30
Cooling	Fanless	Housing	Metal
Dimensions	132.6 x 112.8 x 45mm	Clock	Embedded RTC
Weight	IR912: 565	IR915: 590	
Power			
Power Supply	DC12-48V,	Interface	2-pin 5.08mm industrial
Standby	100mA@24V(HSPA+)	IR915: 160mA@24V(HSPA+)	
Working	150mA@24V(HSAP+)	IR915: 220mA@24V(HSPA+)	
Peak	180mA@24V(HSPA+)	IR915: 230mA@24V(HSPA+)	
Wi-Fi Transmit Power			
Transmit Power	802.11b:13dBm +/-2dBm(11Mbps) 802.11g:13dBm +/-2dBm(54Mbps) 802.11n@2.4GHz:13dBm +/-2dBm(HT20 MCS7) 802.11n@2.4GHz:13dBm +/-2dBm(HT40 MCS7)		
Environment			
Storage	-40 ~ 85°C	Working	-25 ~ 70°C
Humidity	5 ~ 95% (non-condensing)		
Indicators			
LED	POWER, STATUS, WARN, ERROR, MODEM, SIM, VPN, Signal		
EMC			
ESD	EN61000-4-2, level 4	RFI	EN61000-4-3, level 4
EFT	EN61000-4-4, level 4	Surge	EN61000-4-5, level 3
Conducted Disturbances	EN61000-4-6,level 4	Oscillatory Wave	EN61000-4-12,level 4
Frequency Magnetic Field	EN61000-4-8, horizontal/vertical 400A/m (>level 4)		
Mechanical			
Shock	IEC60068-2-27	Vibration	IEC60068-2-6
Free Fall	IEC60068-2-32		
Approvals and Compliance			
CE, FCC, UL, PTCRB, CCC, Verizon, AT&T, E-MARK, IC, IMDA, RCM			

Ordering Information

Part Number	Part Number Code : IR91X-<N1>-<WMNN>-<W>-S-<GPS>				
	<N1>: Module	<WMNN>: Cellular Networks	<W/NA>: WLAN (IR915 only)	S: Serial Port (IR915 only)	<G/NA>: GPS (IR915 only)
IR912L-TL00 IR915L-TL00-<W>-S-<GPS>	L: 4G LTE	(For China, LTE CAT4) LTE-FDD Band 1/3/5/8 LTE-TDD Band 38/39/40/41 HSPA+/UMTS Band 1/5/8/9 EDGE/GPRS/GSM 900/1800MHz	W: Wi-Fi <NA>: No Wi-Fi	S: RS232 RS485	G: GPS <NA>: No GPS
IR912L-FH20 IR915L-FH20-<W>-S-<GPS>	L: 4G LTE	(For Europe & APAC, LTE CAT4) LTE-FDD Band 1/2/3/5/7/8/20 UMTS/HSPA+ Band 1/2/5/8 EDGE/GPRS/GSM 850/900/1800/1900MHz	W: Wi-Fi <NA>: No Wi-Fi	S: RS232 RS485	G: GPS <NA>: No GPS
IR912L-FS18 IR915L-FS18-<W>-S-<GPS>	L: 4G LTE	(For North America, AT&T, LTE CAT3) LTE-FDD Band 2/4/5/17 UMTS(HSPA+) Band 2/4/5 EDGE/GPRS/GSM 850/900/1800/1900MHz	W: Wi-Fi <NA>: No Wi-Fi	S: RS232 RS485	G: GPS <NA>: No GPS
IR915L-FS28-<W>-S-<GPS>	L: 4G LTE	LTE-FDD Band 4/13 (For North America, Verizon Wireless)	W: Wi-Fi <NA>: No Wi-Fi	S: RS232 RS485	G: GPS <NA>: No GPS
IR912L-FQ38 IR915L-FQ38-<W>-S-<GPS>	L: 4G LTE	(For North America, Verizon Wireless, LTE CAT4) LTE-FDD Band2/4/5/12/13/14/66/71 UMTS(DC-HSPA+) Band 2/5	W: Wi-Fi <NA>: No Wi-Fi	S: RS232 RS485	G: GPS <NA>: No GPS
IR912L-FQ78 IR915L-FQ78-<W>-S-<GPS>	L: 4G LTE	(For Australia & South America, LTE CAT4) LTE-FDD Band 1/2/3/4/5/7/8/28 LTE-TDD Band 40 WCDMA Band 1/2/5/8 GSM Band 2/3/5/8	W: Wi-Fi <NA>: No Wi-Fi	S: RS232 RS485	G: GPS <NA>: No GPS
IR912P-EN00 IR915P-EN00-<W>-S-<GPS>	P: No 3G/4G	No 3G/4G	W: Wi-Fi <NA>: No Wi-Fi	S: RS232 RS485	G: GPS <NA>: No GPS
Example	IR915P-PS08-W-S-GPS: 5x ETH, VPN, HSPA+, WLAN, RS-232&RS-485, I/O IR912L-FS08: 2x ETH, FDD, HSPA+/WCDMA/GPRS				

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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3900 Jermantown Rd., Suite 150, Fairfax, VA 22030 USA
T: +1 (703) 348-2988
E: info@inhandnetworks.com
W: www.inhandnetworks.com