# ICR-4461

## Ultra High-Speed 5G Router & **Powerful Edge Computing Gateway**



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The ICR-4461 is an Ultra-high-speed 5G NR (New Radio) Router & Powerful Edge Computing Gateway focused on the global market. The 5G "gigabit" speed and low latency, and high network availability is a real step to massive IoT and Enhanced mobile broadband (eMBB) applications - Mobile Internet access, Camera and security systems, Industrial systems, and many other high data demand applications. The router supports fallback via LTE (LTE-A Pro) and 3G networks for areas where 5G coverage is not developed yet.

The new router platform "v4" provides intelligence at the network edge with an extremely powerful Cortex A72 CPU at 1200 MHz, 4 GB eMMC memory, 4 MB flash memory, and 1024 MB RAM. The focus on high security underlines using TPM 2.0, and Tamper Button that ensure safe use in critical infrastructure systems.

The ICR-4461 is powered by the ICR-OS Linux operating system that provides a wide range of enhanced networking features. A secure Web interface allows users to configure and manage routers from remote locations. The router supports multiple configuration profiles, automatic firmware updates, etc. The router can be used as a powerful edge computing gateway because of the support of many ways of software customization. Users may insert Linux scripts and add new features by additional applications called Router Apps (User Modules).

#### **Features**

- 5G NR Cellular Connectivity, Sub-6GHz
- 3GPP Release 16, Support both NSA and SA modes
- Quad-core CPU with 1 GB RAM
- 2× SIM, eSIM Ready, TPM 2.0
- 5× Gigabit Ethernet (Optional 4× PoE+ PSE)
- SFP Connector for SFP modules up to 10 Gbps
- GNSS Receiver, Micro SD Card
- RS232, RS485, CAN BUS, 2× DI, 2× DO, USB Host
- · Robust metal cover with wall and DIN mount options
- Wide operational temperature range
- Optional Dual-Band WiFi

Project based customization: SSD disc, Dual Concurrent WiFi AP, Bluetooth

There is an existing free library of Router Apps or the user may create own app using Advantech SDK. The gateway can easily run applications like Node-RED or Docker that open the way to a multi-container world.

The ICR-4461 is designed and manufactured for use in tough environmental conditions. Specifications include a wide operating temperature ranges from -40 up to +75 °C. It accepts input voltage range from 9 V DC to 48 V DC and is equipped with sleep mode for reducing electrical consumption.

As a standard, ICR-4461 is equipped with five Ethernet 10/100/1000 Mbps (1× independent and 4× switch), SFP cage (independent port), one USB host 2.0, microSD reader, serial lines RS232 and RS485, CAN Bus, two binary inputs, and two binary outputs. This router contains two SIMs readers, which are placed on the rear side of the device. There is also the possibility to use one eSIM. ICR-4400 has two mPCle connectors that can be used for two WiFi modules. The router is supplied in a robust metal casing for a wall mount (DIN mount is optional).

ICR-4461 is easy to manage using WebAccess/DMP, full-featured cloud-based management, provisioning, and monitoring tool for mass deployment. The WebAccess/ VPN is a perfect way how to create secure virtual private networks on the Internet.



Introduction







# WebAccess/DMP WebAccess/VPN

#### **Order Codes**

Model no Order	Codes	REGION	5× Gigabit Ethernet	4× PoE PSE+	SFP cage (up to 10 Gbps)	RS232 RS485 CAN BUS I/O	GNSS	4× ANT	2× SIM	WiFi 802ac	Operating Temperature
	ICR-4461	GLOBAL* NAM	~		~	~	~	~	~	NONE	-40 to +75 °C
	ICR-4461S	GLOBAL* NAM	~	~	~	~	~	~	~	NONE	-40 to +75 °C
:::. <u>:</u> :	ICR-4461W3	GLOBAL* NAM	~		~	~	~	~	~	2×2 MIM0	-40 to +75 °C
:::: <u>:</u> :	ICR-4461W3S	GLOBAL* NAM	~	~	√	~	~	~	~	2×2 MIM0	-40 to +75 °C

- Router is compatible with cellular networks in the indicated region. Importer/operator needs to check locale legislation (standards, national Telecom approvals etc.) and compare with standards available for product if possible to operate the router in target region legally.

All product specifications are subject to change without notice.

## **ICR-4461**

# **Specifications**

GNSS

Quad-Core ARM Cortex-A72, 1200 MHz
RAM - 1024 MB eMMC - 4096 MB (838 MB for Router Apps, 512 MB for customer data)
HW Watchdog
Battery backup RTC
Trusted Platform Module (TPM) 2.0
5× Ethernet (4+1), RJ45, 10/100/1000 Mbps, isolation 1.5 kV *Optional 4× PoE PSE IEEE 802.3at-2009 (PoE+) and IEEE 802.3af-2003 (PoE) (PoE use is limited – see the ICR-4461 user manual)
1× SFP cage (up to 10 Gbps)
1× RS232 (Tx, Rx, GND, RTS, CTS) 1× RS485 (A(-), B(+), GND) 1× CAN (CAN_H, CAN_L) (14-pin terminal block)
2× Digital Input (3 mA consumption) 2× Digital Output (Open Drain, 48 V / 500 mA) (14-pin terminal block)
1× USB 2.0 Host Connector
1× Micro SD Card Slot
Reboot / Factory reset
System, 3-level signal strength, Data activity, SIM1/SIM2 status, 3G/4G/5G technology, 2× Input, 2× Output, User, ETH
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Environmental				
Power Supply	9 – 48 V DC (2-pin terminal block)			
Consumption	Without WiFi Idle 4.6 W / Average 6.1 W / Peak 14 W With WiFi Idle 5.9 W / Average 8.1 W / Peak 16 W PoE PSE without WiFi Idle 4.9 W / Average 6.1 W / Peak 128 W PoE PSE with WiFi Idle 6.2 W / Average 8.1 W / Peak 130 W			
Sleep Mode	Yes, 24 mW, 310 mW for PoE PSE			
Operating Temperature	-40 to +75 °C			
Storage Temperature	-40 to +85 °C			
Humidity	0 to 95 %			
IP Cover	IP30			
Physical Characteristics				
Dimensions	47 × 110 × 195 mm			
Enclosure	Robust Metal Case, Grounding Screw			
Mounting	Wall Mounting, DIN Rail (optional)			
Weight	1275 g			

WiFi - optional (ICR-4461W3, ICR-4461W3S)					
Antenna	2× R-SMA connectors, 2×2 MIMO				
Standards IEEE802.11 ac/a/b/g/n 2.4 GHz / 5 GHz					
Data Rate	Up to 300 Mbps @ 2.4 GHz Up to 867 Mbps @ 5 GHz				
Security	WEP, WPA, WPA2, WPA3, 802.1X				
Modes	Access Point (unlimited clients), Station, Multirole STA & AP				

Systems	GPS, GLONASS, BeiDou, Galileo, QZSS, SBAS	
Protocol	NMEA	

Cellular Interface					
SIM Slots	2× SIM (Mini SIMs – 2FF) 1× eSIM Ready				
Antennas 4× SMA connector					
5G NR frequency bands	5G NSA Bands: n1/n2/n3/n5/n7/n8/n12/n13/n14/n18/n20/n25/n26/n28/n29/n30/n38/n40/n41/n48/n66/n70/n71/n75/n76/n77/n78/n79 Transfer rate: 3.4 Gbps (DL), 550 Mbps (UL) 5G SA Bands: n1/n2/n3/n5/n7/n8/n12/n13/n14/n18/n20/n25/n26/n28/n29/n30/n38/n40/n41/n48/n66/n70/n71/n75/n76/n77/n78/n79 Transfer rate: 2.4 Gbps (DL), 900 Mbps (UL)				
LTE Parameters	LTE-FDD Bands: B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B66/B71 LTE-TDD Bands: B34/B38/B39/B40/B41/B42/B43/B48 LTE LAA: B46 Transfer rate: 1.6 Gbps (DL), 200 Mbps (UL)				
HSPA+/UMTS Parameters	Supported frequency bands: B1/B2/B3/B4/B5/B6/B8/B19 Transfer rate: 42 Mbps (DL), 5.76 Mbps (UL)				

## ICR-4461

Software		
Operating System	ICR-OS (Linux based)	
SW Customization	Router App (User Modules)*	
Application Development	Open Linux, *Python, BASH, C/C++, *Node-RED, *Docker	
Networking Features and Protocols	DHCP, NAT/PAT, SSH, VRRP, PPPoE, SNMP, SMTP, Dynamic DNS client, DNS proxy, VLAN, QoS, *DMVPN, NTP Client/Server, *Routing protocols RIP, BGP, OSPF, IS-IS, NHRP, Backup Routes, Port Forwarding, Host Port Routing, Ethernet Bridging, Load Balancing, IPv6 Dual Stack	
Industrial Protocols and IoT	*Modbus RTU/TCP gateway, *IEC 60870-5-101 to 104 gateway, *DF1, *DNP3, *MQTT, *LWM2M	
Security	HTTPS, SSH, SFTP, DMZ, Firewall (IP Filtering, MAC address filtering, Inbound and outbound Port filtering) VPN Tunneling – WireGuard, OpenVPN, *EasyVPN, IPsec with IKEv1 and IKEv2, GRE, L2TP, PPTP Authentication – RADIUS, TACACS+, 2FA, *SCEP Encryption – DES, 3DES, AES, RSA, MD5, SHA	
Firmware Management	Automatic firmware updates – server, locally via LAN or remotely via WAN Over-the-Air cellular module firmware updates	
Diagnostic/Log	Status – Signal Strength, Data Usage, Detailed Long Term Statistics One CLICK report – Current Configuration, Factory Identification, Routing Table Log – System Log, Reboot Log, Kernel Log Remote Diagnostics (via SSH)	
Event Engine	StartUp script & Up/Down script (Own rules based on Digital Inputs, Network Parameters, Data Usage, Timer, Power, Device Temperature) Report Types: SMS, email, SNMP Trap	
Configuration	Web server, SSH, Four configuration switchable profiles, Automatic configuration update from server, Backup & Restore configuration	
Advanced Software Tools	WebAccess/DMP – Remote Device Provisioning, Monitoring & Management Platform WebAccess/VPN – Advanced Secure Networking Platform	

\*Functionality is available with installed Router App (User Module)

Standards & Regulations PRELIMINARY - SUBJECT TO CHANGE				
Radio	FCC part 22H, FCC part 24E, FCC part 27, PTCRB			
EMC	EN 61000-6-2, FCC part 15.B, ICES-003 Issue 6			
Safety	IEC 62368-1			
National	FCC, IC, CE. UKCA			
Carrier Approval	AT&T, Verizon PROJECT BASED T-Mobile PROJECT BASED FirstNet PROJECT BASED			
Mechanical	EN 60068-2-27, EN 60068-2-64, EN 60068-2-64, MIL-STD-810G, SAE J1455			
Climatic	EN 60068-2-2, EN 60068-2-1, EN 60068-2-14, EN 60068-2-78, MIL-STD-810G, SAE J1455			
Environmental	REACH, RoHS3, WEEE			
Cellular Module Approvals*	Regulatory: GCF, FCC, IC, PTCRB Carrier: Verizon, AT&T (FirstNet), T-Mobile, U.S. Cellular, Rogers, Telus			

\*- Approvals are valid for the integrated cellular module inside the router only. Cellular module approvals are not always applicable for the whole router – see "Standards and Regulations" chart for complete router approvals available.

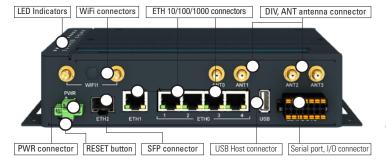
# Accessories

Part Number	Description	Included in the package	
BB-CON-WR2	2-pin PWR connector		
CON-ICR44-14	DN-ICR44-14 14-pin Serial / IO connector		
	Wall mount kit		
BB-DIN-ICR32	DIN clip (2 pcs are necessary for the mounting)		
RPS-ICR4-WR2-M	Wall mount Power supply, 12 V/1.5 A, EU, UK, US, AUS plugs		
RPS-ICR4-WR2-PSE	**Desktop Power supply POE PSE, 48 V / 1.35 A (65W), (without Power Cord)		
BB-PWRCORD-AUS	AUS Power Cord (for RPS-ICR4-WR2-PSE)		
BB-PWRCORD-EU	EU Power Cord (for RPS-ICR4-WR2-PSE)		
BB-PWRCORD-UK	3-PWRCORD-UK UK Power Cord (for RPS-ICR4-WR2-PSE)		
BB-PWRCORD-US	B-PWRCORD-US US Power Cord (for RPS-ICR4-WR2-PSE)		
BB-KD-ETH	(D-ETH Ethernet cross cable, 1.5 m, Shielded		
BB-AW-A2458G-FSRPK	AW-A2458G-FSRPK Antenna Wi-Fi, 2.4 & 5.8 GHz (2 pcs are recommended for full 2×2 MIMO performance)		
BB-AP-AGNSS-SMA	Antenna GNSS, magnetic 3dB, cable 3m		
ANT-LTE5G-025	Antenna 5G/LTE, Terminal (4 pcs are recommended for full cellular 5G performance)		
BB-2J7B83BC-150	Antenna 4in1 5G/LTE MIMO, Screw mount, 4× cable 1.5 m		
For more Antenna accessories vis	it www.advantech.com **Required power supply wh	en used PoE/PoE+ on all ports is 48V / 150W	
Industrial Cellular Gat	ntech.com/products		

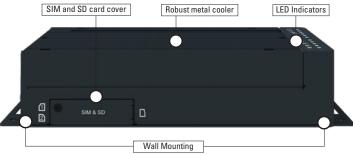
## ICR-4461

## Views





**REAR VIEW** 



#### **LEFT SIDE VIEW**



#### **BOTTOM VIEW - WALL MOUNT KIT**

Wall Mounting

### **RIGHT SIDE VIEW**



#### **BOTTOM VIEW - DIN HOLDERS**

