ICR-4461

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

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, 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
- Carriers certifications: AT&T, FirstNet (planned)

Project based customization: Chip SIM (MFF2), SSD disc, Dual Concurrent WiFi AP

Introduction

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 - 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).

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.

ICR-4400 has two mPCIe connectors that can be used for two WiFi modules with 802.11a,b,g,n,ac modes, 2×2 MIMO support, and Bluetooth v5.0 are available. 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.

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	Bluetooth 5.0	Operating Temperature
	ICR-4461	EMEA NAM*	✓		✓	✓	✓	✓	✓	NONE		-40 to +75 °C
	ICR-4461S	EMEA NAM*	✓	✓	✓	✓	✓	✓	✓	NONE		-40 to +75 °C
	ICR-4461W3	EMEA NAM*	✓		✓	✓	✓	✓	✓	2×2 MIMO	✓	-40 to +75 °C
	ICR-4461W3S	EMEA NAM*	✓	✓	✓	✓	✓	✓	✓	2×2 MIMO	✓	-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.

Specifications

System	
CPU	Quad-Core ARM Cortex-A72, 1200 MHz
Memory	RAM - 1024 MB eMMC - 4096 MB (838 MB for Router Apps, 512 MB for customer data)
Watchdog	HW Watchdog
RTC	Battery backup RTC
TPM	Trusted Platform Module (TPM) 2.0

Interfaces	
Ethernet	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)
SFP Cage	1× SFP cage (up to 10 Gbps)
Serial Lines	1× RS232 (Tx, Rx, GND, RTS, CTS) 1× RS485 (A(-), B(+), GND) 1× CAN (CAN_H, CAN_L) (14-pin terminal block)
I / O	2× Digital Input (3 mA consumption) 2× Digital Output (Open Drain, 48 V / 500 mA) (14-pin terminal block)
USB	1× USB 2.0 Host Connector
MicroSD Card	1× Micro SD Card Slot
Reset Button	Reboot / Factory reset
LED Indicators	System, 3-level signal strength, Data activity, SIM1/SIM2 status, 3G/4G/5G technology, 2× Input, 2× Output, User, ETH

GNSS	
Antenna	Passive antenna, GNSS L1 band on the ANT3, L5 on the ANT1
Systems	GPS, GLONASS, BeiDou, Galileo, QZSS, SBAS
Protocol	NMEA
Ac Time-to-First-Fix	Cold start: 27.93 s Warm start: 11.55 s Hot start: 1.09 s

Bluetooth - optional	
Antenna	Shared R-SMA WiFi antenna connector
Bluetooth	Bluetooth 5.0

Environmental	
Power Supply	9 – 48 V DC (2-pin terminal block)
Consumption	**Without WiFi** Idle 5.5 W / Average 6.2 W / Max 14 W **With WiFi** Idle 6.4 W / Average 8.7 W / Max 14.2 W **PoE PSE without WiFi** Idle 5.6 W / Average 6.5 W / Max 138.6 W **PoE PSE with WiFi** Idle 6.2 W / Average 8.1 W / Max 142 W
Sleep Mode	Yes, 3 mW, 170 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	ICR-4461 1330 g ICR-4461S 1340 g ICR-4461W3 1400 g ICR-4461W3S 1410 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

Cellular Interface	
SIM Slots	2× SIM (Mini SIMs – 2FF) *1× Chip SIM (MFF2)
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)

* Project-based customization

Software	
Operating System	ICR-OS (Linux based)
SW Customization	Router App (User Modules)*
Application Development	Linux based router SDK, *Python, BASH, C/C++, *Node-RED, *Docker
Networking Features and Protocols	Static Routes, 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, Multi-user (add/remove/manage users)
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	
Radio	EN 301 908-1, EN 301 908-2, EN 301 908-13, EN 301 908-25, EN 303 413, EN 300 328, EN 301 893 FCC part 22H, FCC part 24E, FCC part 27, FCC part 90, FCC part 96, PTCRB
EMC	EN 301 491-1, EN 301 489-17, EN 301 489-19, EN 301 489-52, EN 610000-6-2, EN 610000-6-3, EN 55032, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, FCC part 15.B, FCC part 15C, FCC part 15E
Safety	IEC 62368-1
Transportation	E-mark
National	CE, UKCA, FCC, IC
Carrier Approval	AT&T, Verizon PROJECT BASED T-Mobile PROJECT BASED FirstNet IN PROCESS
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.
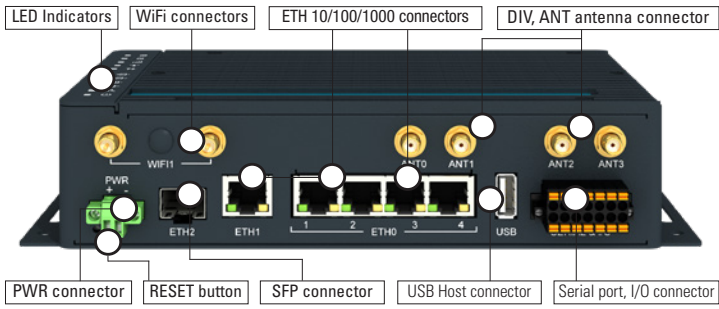
Accessories

Part Number	Description	Included in the package
BB-CON-WR2	2-pin PWR connector	
CON-ICR44-14	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	UK Power Cord (for RPS-ICR4-WR2-PSE)	Optional
BB-PWRCORD-US	US Power Cord (for RPS-ICR4-WR2-PSE)	
BB-KD-ETH	Ethernet cross cable, 1.5 m, Shielded	
BB-AW-A2458G-FSRPK	Antenna Wi-Fi, 2.4 & 5.8 GHz (2 pcs are recommended for full 2×2 MIMO performance)	
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	

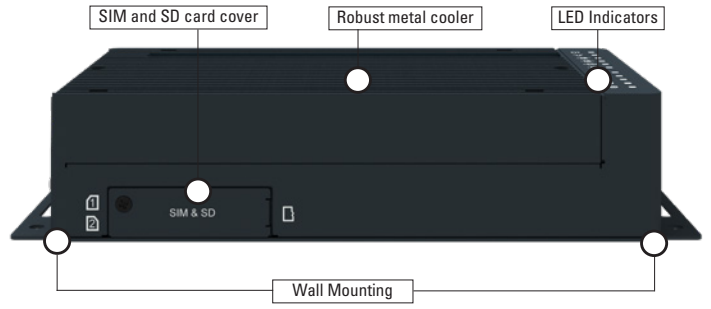For more Antenna accessories visit **www.advantech.com**   **Required power supply when used PoE/PoE+ on all ports is 48V / 150W
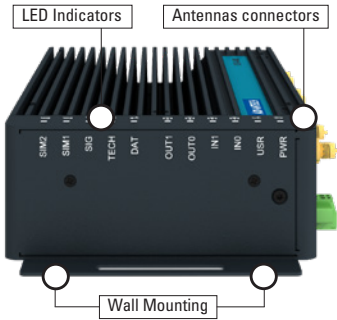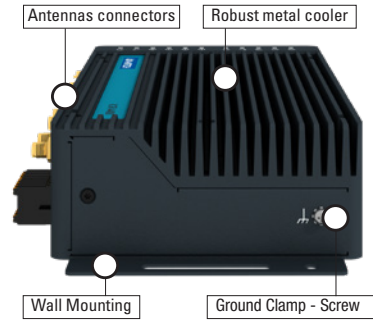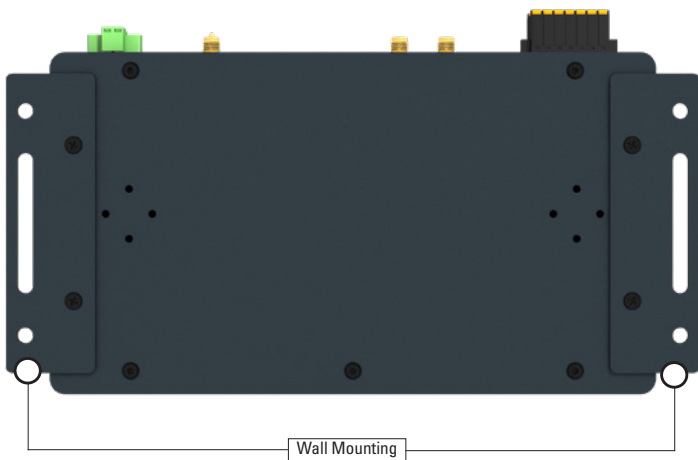
Views

FRONT VIEW

LED Indicators | WiFi connectors | ETH 10/100/1000 connectors | DIV, ANT antenna connector

WIFI1 | ANT0 ANT1 | ANT2 ANT3

PWR | ETH2 | ETH1 | 1 2 ETH0 3 4 | USB

PWR connector | RESET button | SFP connector | USB Host connector | Serial port, I/O connector

REAR VIEW

SIM and SD card cover | Robust metal cooler | LED Indicators

SIM & SD

Wall Mounting

LEFT SIDE VIEW

LED Indicators | Antennas connectors

SIM2 SIM1 SIG TECH DAT OUT1 OUT0 IN1 IN0 USR PWR

Wall Mounting

RIGHT SIDE VIEW

Antennas connectors | Robust metal cooler

Wall Mounting | Ground Clamp - Screw

BOTTOM VIEW - WALL MOUNT KIT

Wall Mounting

BOTTOM VIEW - DIN HOLDERS
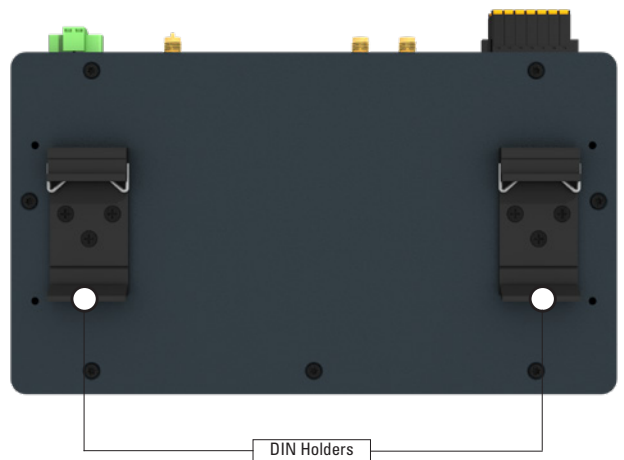
DIN Holders

Dimensions - Technical Drawing

Unit: mm

Version with wall mount

SIM2
SIM1
SIG
TECH
DAT
OUT1
OUT0
IN1
IN0
USR
PWR

110
47

210,3
96
72
Φ5
9,6

ADVANTECH
ICR-4400

48,2
195
1,2
222,7

PWR
+ -
RST   ETH2   ETH1   1   2   ETH0   3   4   USB   SERIAL & I/O
ANT0 ANT1   ANT2 ANT3
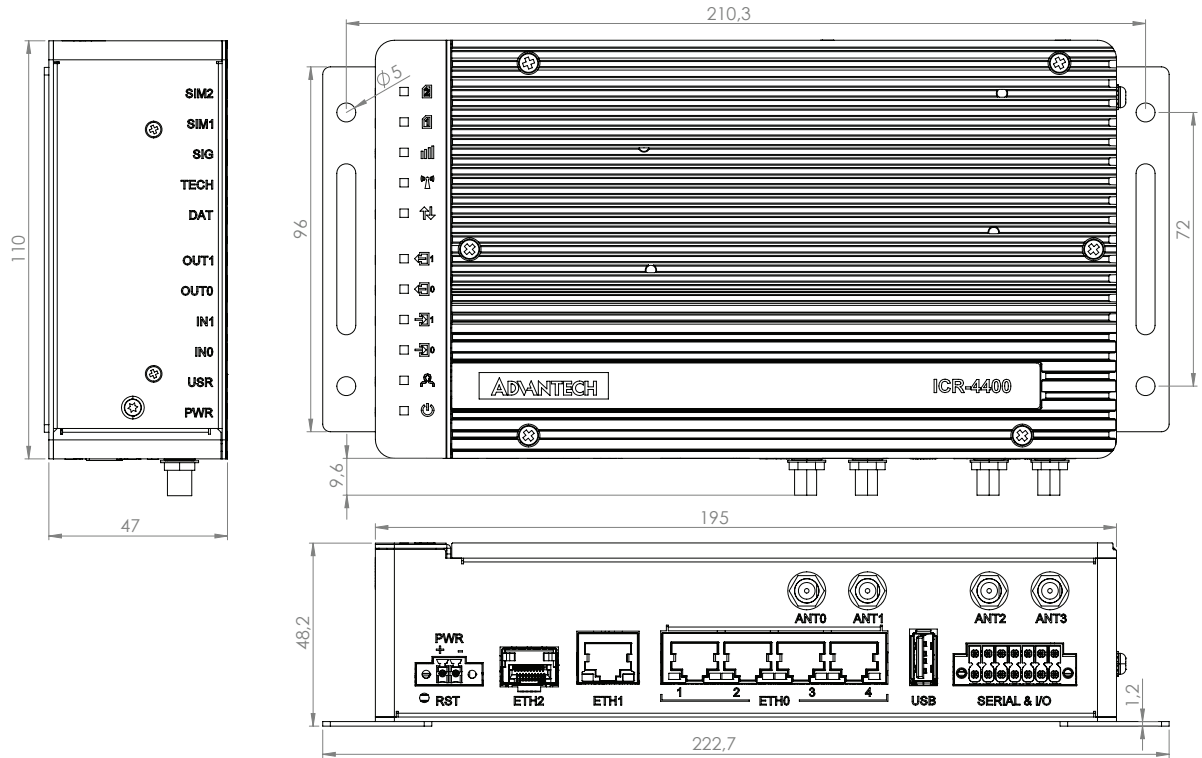
Version with DIN Holders

SIM2
SIM1
SIG
TECH
DAT
OUT1
OUT0
IN1
IN0
USR
PWR

55
55
110
47
56,2

ADVANTECH
ICR-4400

9,6
195
56,2
47

PWR
+ -
RST   ETH2   ETH1   1   2   ETH0   3   4   USB   SERIAL & I/O
ANT0 ANT1   ANT2 ANT3