ICR-4161, ICR-4261

Industrial 5G Router & IoT 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
- 2× Gigabit Ethernet
- USB Host 3.0
- 2× Serial RS232/RS485, 4× DI, 2× DO (ICR-4200)
- GNSS Receiver, Micro SD Card
- Robust metal cover with wall and DIN mount options
- Wide operational temperature range
- Optional Tri-Band WiFi 6 and Bluetooth V5.2

Project-based customization: Chip SIM (MFF2)

Introduction

The ICR-41/4200 router family is a cutting-edge series of industrial routers that harness the power of 5G technology. Designed for the EMEA market it offers lightning-fast data transfer speed, low latency, and high network availability. Those 5G routers provide several advantages over 4G/3G/2G counterparts making them the ideal choice for a wide range of industrial applications.

Low latency is probably the most significant advantage of the 5G and ICR-41/4200 router family. By reducing delays in data transmission these routers ensure real-time responsiveness and make them well-suited for applications that require immediate feedback or interaction. Industries can benefit from seamless and instant communication regardless of their geographical location enabling to monitor and control critical processes with precision and accuracy.

The ICR-41/4200 router family is built on a powerful hardware platform with CPU 1.6 GHz that delivers sufficient performance for most todays applications. Advanced processor in combination with 1 GB RAM and 2.9 GB space for customer applications provide the necessary power to handle complex tasks efficiently. This enables industries to leverage the full potential of edge computing, empowering them to process and analyze data closer to the source resulting in reduced latency and improved operational efficiency.

As a standard is ICR-41/4200 router family equipped with two Gigabit Ethernet ports, one USB host 3.0, GNSS receiver, and two SIM readers, which are placed on the right side of the device. Optionally can be a router equipped with two serial ports (RS232/RS485), four digital inputs, two digital outputs, and also with WiFi 6 (IEEE802.11 ax/ac/a/b/g/n 2.4 GHz / 5 GHz / 6 GHz, 2×2 MIMO) and Bluetooth V5.2.

In terms of security the ICR-41/4200 router family prioritizes the protection of critical infrastructure systems. These routers incorporate features like TPM 2.0 and Tamper Button, ensuring the integrity and safety of data transmission. With robust security measures in place, businesses can confidently deploy these routers in sensitive environments knowing that their critical assets and information are well-protected.

Naturally, ICR-41/4200 offers extensive networking features and easy management capabilities. With their intuitive web interfaces users can configure and manage the routers remotely. The routers support multiple configuration profiles, automatic firmware updates, and customizable software options allowing businesses to tailor the routers to their specific needs. This flexibility enables seamless integration with existing systems and the implementation of additional features as required.

To streamline management and deployment of ICR-41/4200 router family can be easily managed using a comprehensive cloud-based tool WebAccess/DMP. This software tool enables centralized management, provisioning, and monitoring of multiple routers, simplifying the process of scaling and maintaining a network infrastructure or centralize management of VPN connections.

ICR-41/4200 router family represents a significant advancement in industrial networking. With advantages such as gigabit Ethernet speed, low latency, and high network availability, these routers empower industries to optimize processes, drive innovation and achieve operational excellence. Combining powerful performance, robust security, and easy management are ICR-41/4200 router family the perfect solution for demanding industrial applications enabling businesses to thrive in the era of 5G connectivity.

ICR-OS RouterApp python Node-RED docker Bluetooth 5 WebAccess/DMP WebAccess/VPN

Order Codes

Model no. - Order Codes		REGION	2× Gigabit Ethernet	2× Serial RS232 R485	GNSS	I/O	1× USB Host 3.0	2× SIM	WiFi 6	Bluetooth V5.2
	ICR-4261	EMEA*	✓	✓	✓	✓	✓	✓		
	ICR-4261W	EMEA*	✓	✓	✓	✓	✓	✓	✓	✓
	ICR-4161	EMEA*	✓		✓		✓	✓		
	ICR-4161W	EMEA*	✓		✓		✓	✓	✓	✓

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

All product specifications are subject to change without notice.

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Specifications

System	
CPU	Quad-Core ARM Cortex-A53, 1.6 GHz
Memory	RAM - 1GB, eMMC - 8 GB (2.18 GB for Router Apps, 474 MB for customer data, 231 MB for system data)
Watchdog	HW Watchdog
RTC	Battery backup RTC
TPM	Trusted Platform Module (TPM) 2.0
Interfaces	
Ethernet	2× Ethernet, RJ45, 10/100/1000 Mbps, isolation 1.5 kV
Serial Lines (**ICR-4200**)	2× RS232/RS485 independently selectable by DIP switch RS232 (Tx, Rx, GND, RTS, CTS), RS485 (A(-), B(+), GND), 16-pin terminal block (no isolation)
I / O (**ICR-4200**)	4× Digital Input (48 V / 3 mA consumption) 2× Digital Output (Open Drain, 48 V / 500 mA) 16-pin terminal block (no isolation)
USB	1× USB 3.0 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, WiFi, User, ETH

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

Environmental	
Power Supply	9 – 48 V DC (2-pin terminal block)
Consumption	**Without WiFi:** Idle 4.9 W / Average 6.8 W / Maximum 10.5 W **With WiFi:** Idle 5.5 W / Average 6.8 W / Peak 13.3 W
Sleep Mode	Yes, 10 mW
Operating Temperature	-40 to +75 °C
Storage Temperature	-40 to +85 °C
Humidity	0 to 95 %
IP Cover	IP30
Physical Characteristics	
Dimensions	43 × 130 × 90 mm
Enclosure	Robust Metal Case, Grounding Screw
Mounting	Wall Mounting, DIN Rail
Weight	ICR-4161: 470 g ICR-4161W: 480 g ICR-4261: 490 g ICR-4261W: 500 g

WiFi - optional (**ICR-4161W, ICR-4261W**)	
Antenna	2× R-SMA connectors, 2×2 MIMO
Standards	IEEE802.11 ax/ac/a/b/g/n 2.4 GHz / 5 GHz / 6 GHz
Data Rate	Up to 450 Mbps @ 2.4 GHz Up to 950 Mbps @ 5 GHz Up to 950 Mbps @ 6 GHz
Security	TKIP, AES, WPA, WPA2, WPA3, 802.1X
Modes	Access Point, Station, Multirole STA & AP, Dual-band concurrent

Bluetooth - optional (**ICR-4161W, ICR-4261W**)	
Antenna	Shared R-SMA WiFi antenna connector
Bluetooth	Bluetooth V5.2

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/B4/B5/B8/B19 Transfer rate: 42 Mbps (DL), 5.76 Mbps (UL)

* Project-based customization

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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	
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
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
Safety	IEC 62368-1
Transportation	E-mark
National	CE, UKCA
Mechanical	EN 60529, EN 60068-2-27, EN 60068-2-64
Climatic	EN 60068-2-2, EN 60068-2-1, EN 60068-2-14, EN 60068-2-78
Environmental	REACH, RoHS3, WEEE
Cellular Module Approvals*	Regulatory: GCF, CE, FCC, IC, PTCRB, RCM, CCC, Anatel, JATE, TELEC, KC, NCC Carrier: Verizon, AT&T, FirstNet T-Mobile, NTT, DT, Telstra

*- 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-ICR28-16	16-pin Serial / IO connector	
	Wall mount kit	
BB-DIN-ICR32	DIN clip	
RPS-ICR4-WR2-M	Wall mount Power supply, 12 V / 1.5 A, EU, UK, US, AUS plugs	Optional
BB-KD-ETH	Ethernet cross cable, 1.5 m, Shielded	
ANT-LTE5G-025	Antenna 5G/LTE, Terminal (4 pcs are recommended for full cellular performance)	
OPT1-ANT-WFT-06	Antenna Wi-Fi, 2.4 GHz / 5 GHz/ 6 GHz (2 pcs are recommended for full 2×2 MIMO performance)	
BB-2J7B83BC-150	Antenna 4in1 5G/LTE MIMO, GNSS, Screw mount, 4× cable 1.5 m	
OPT1-ANT-5GSDWG-15	Antenna 6in1 5G/LTE MIMO, WIFI 6 MIMO, GNSS, screw mount, 6x cable 1.5m	

For more Antenna accessories visit **www.advantech.com**

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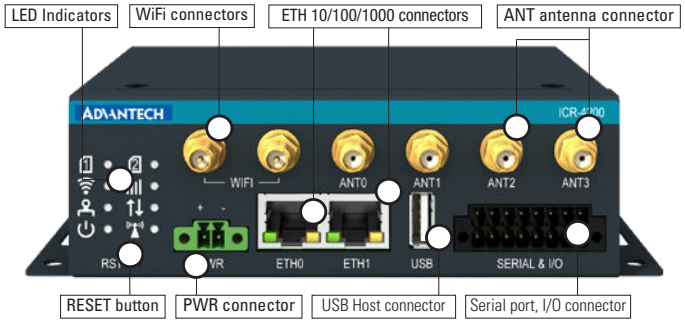
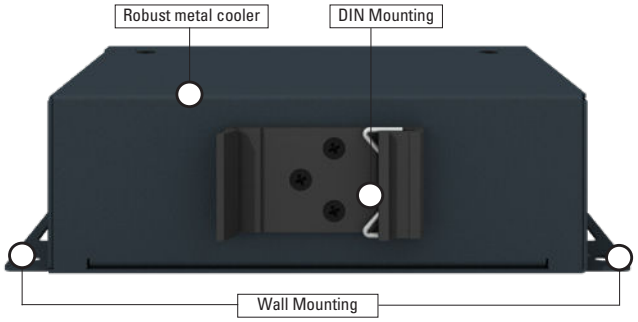
ICR-4200 Views

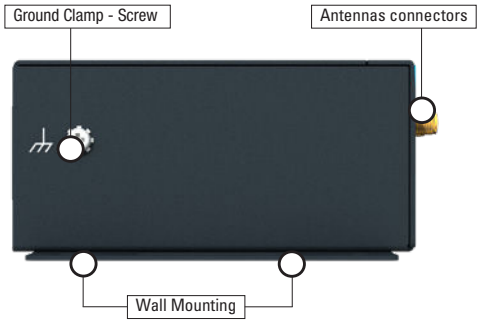
FRONT VIEW



REAR VIEW



LEFT SIDE VIEW



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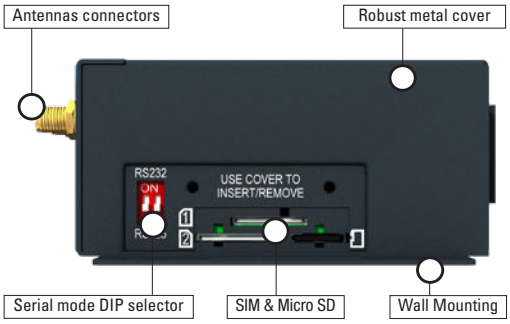
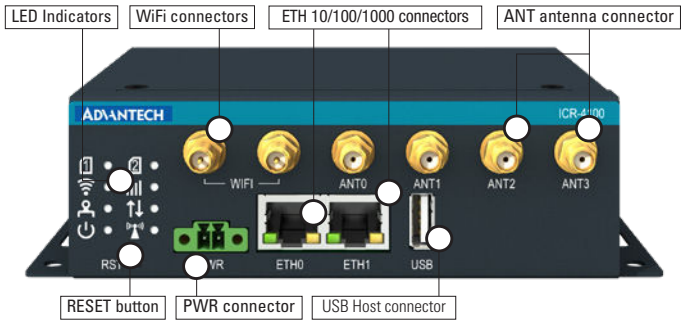


ICR-4100 Views

FRONT VIEW



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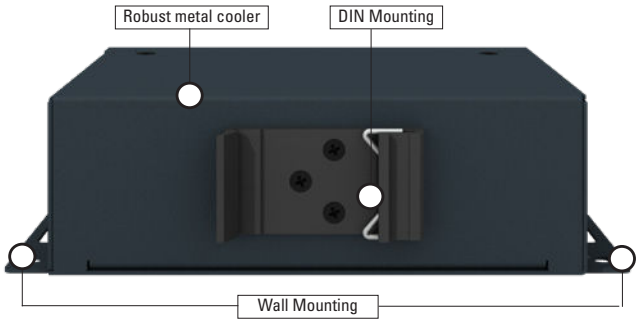
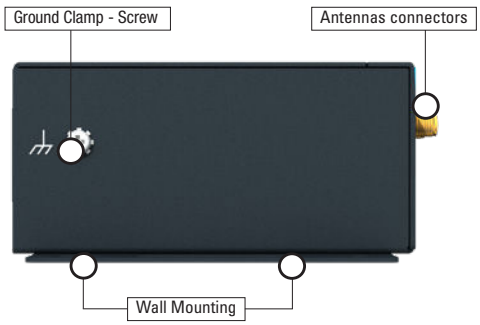
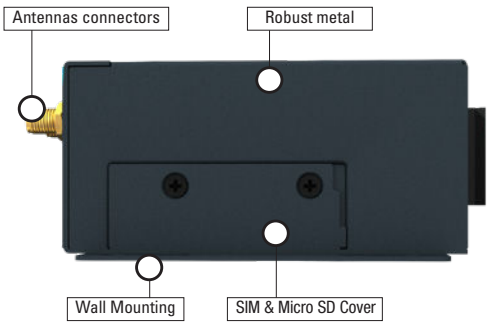


LEFT SIDE VIEW



RIGHT SIDE VIEW



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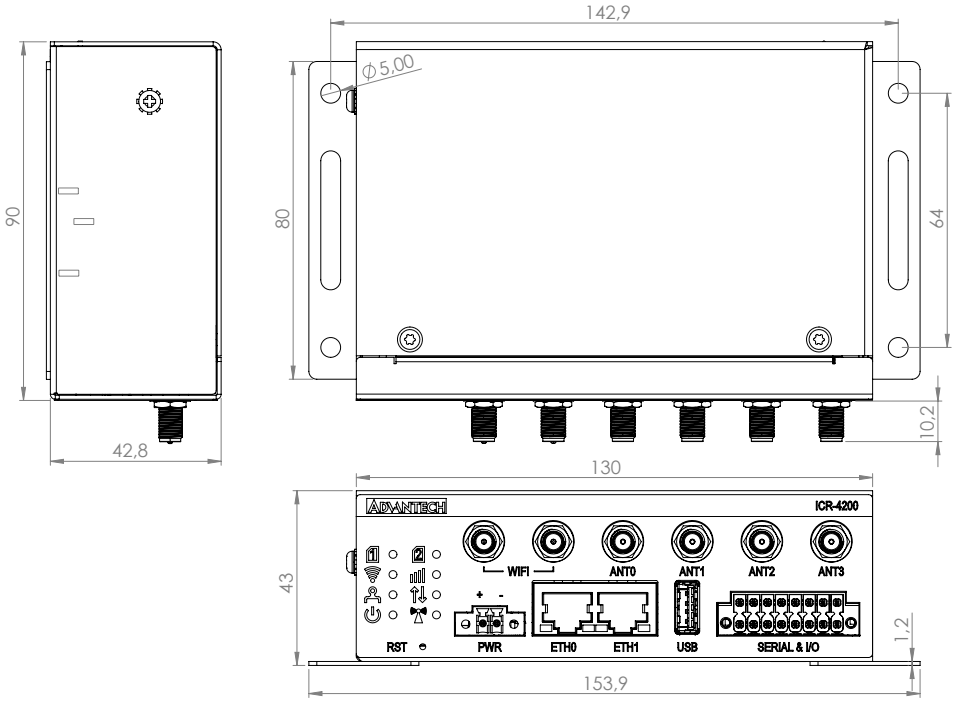
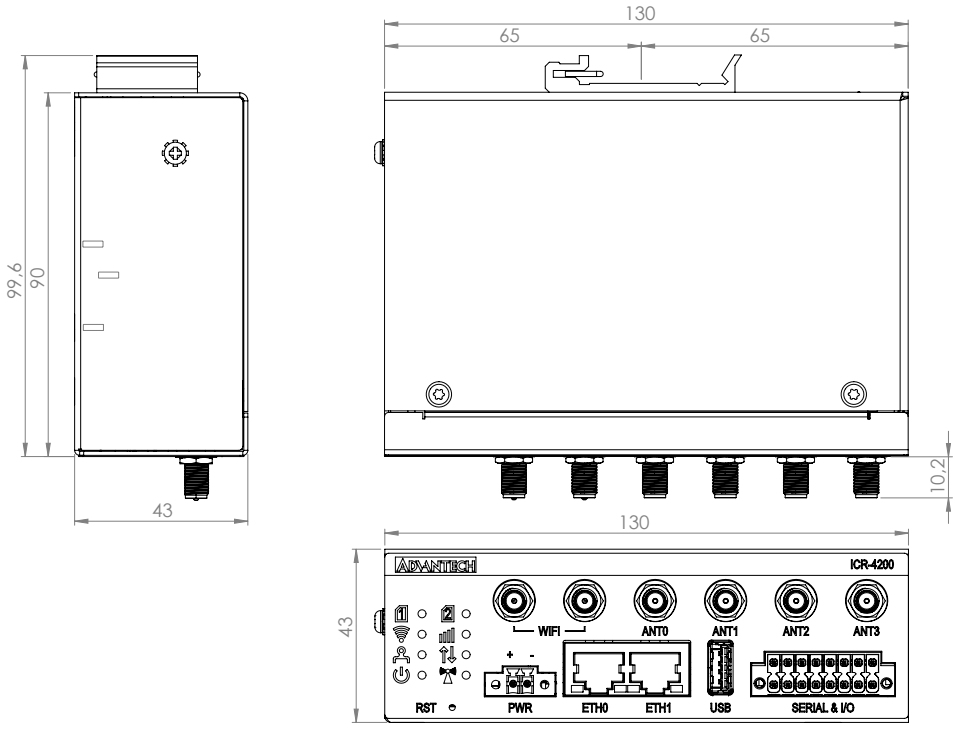
Dimensions - Technical Drawing

Unit: mm

Wall Mount



DIN Holder