

# Industrial Cellular Routers & Gateways

## ICR-3241

### Industrial 4G Router & IoT Gateway



- LTE Cat.4 with 3G/2G fallback
- Carriers support; Verizon, AT&T, T-Mobile, FirstNet (Public Safety)
- Powerful CPU with 1.3 GB storage to host customer SW applications
- 2x SIM with cover, eSIM ready
- 2x Ethernet 10/100, 1x RS232, 1x RS485 and I/O
- Robust metal cover with DIN and Wall mount options
- Operational temperature range from -40 °C to +75 °C
- Backup real time clock
- Sleep mode & Power ignition
- Optional Wi-Fi 802.11ac, 2x2 MIMO
- Optional Bluetooth v5.1 (class 1)
- Optional GNSS receive
- E-Mark and EN 50155 Railway compliance

### Introduction



The ICR-3200 4G LTE gateway is the perfect way to connect IP or serial devices via a cellular network. Industrial M2M and IoT applications include SCADA, industrial PCs, HMIs, traffic controllers, CCTV, meters, kiosks, UPS systems, and much more.

With LTE Cat.4 upload speeds of up to 50 Mbps and download speeds of up to 150 Mbps, the router provides ample bandwidth for high data demand applications. The device has two SIM card readers for carrier failover redundancy. As an addition the router is ready to use internal eSIM (Customization).

In addition to its two independent Ethernet ports, serial ports RS232 and RS485, ICR-3200 has built-in digital I/O connectivity, backup real-time clock and sleep mode support. An optional built-in modules WiFi with 802.11a,b,g,n,ac modes, 2x2 MIMO support and Bluetooth v5.1 are available. Optional built-in GNSS chipset provides information about the accurate position of the router.

The ICR-3200 places intelligence at the network edge with a powerful Cortex A8 CPU at 1GHz, 512 MB RAM, and 4 GB EMMC FLASH memory in pSLC mode for a long-lifetime and critical industrial applications. 1.3 GB of memory space is allocated for customer SW applications and data.

With an open Linux-based ICR-OS operating system and wide possibilities of programming customer SW applications in Python, C/C++ or browser-based flow editor Node-RED, or even Docker containers the ICR-3200 offers a real open development platform for Industrial IoT applications.

The Advantech existing Router App library (User modules) with apps already developed to enhance specific router functionality including industrial protocol conversions and support of IoT platforms such as MS Azure, Cumulocity, and others are supported on the router.

The router supports VPN tunnel creation using various protocols to ensure safe communications. The router provides diagnostic functions which include automatic monitoring of the wireless and wired connections, automatic restart in case of connection losses, and a hardware watchdog that monitors the router status.

ICR-3200 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 | FirstNet Certification | 2x Ethernet | RS232 RS485 | GNSS | I/O | LTE ANT + DIV | 2x SIM | WiFi 802.11ac | Bluetooth v5.1 (class1) | WebAccess/DMP |
|-------------------------|--------|------------------------|-------------|-------------|------|-----|---------------|--------|---------------|-------------------------|---------------|
| ICR-3241                | NAM    | ✓                      | ✓           | ✓           |      | ✓   | ✓             | ✓      |               |                         |               |
| ICR-3241W               | NAM    | ✓                      | ✓           | ✓           | ✓    | ✓   | ✓             | ✓      | ✓             | ✓                       |               |
| ICR-3241-ND             | NAM    | ✓                      | ✓           | ✓           |      | ✓   | ✓             | ✓      |               |                         | ✓             |
| ICR-3241W-ND            | NAM    | ✓                      | ✓           | ✓           | ✓    | ✓   | ✓             | ✓      | ✓             | ✓                       | ✓             |

\* - 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

### Specifications

| System         |  |
|----------------|--|
| CPU            | Cortex-A8, 1000 MHz  |
| Memory         | RAM – 512 MB<br>eMMC – 4096 MB<br>(838 MB for Router Apps, 512 MB for customer data)             |
| Watchdog       | HW Watchdog  |
| RTC            | Battery backup RTC   |
| Interfaces     |  |
| Ethernet       | 2× Ethernet, RJ45, 10/100 Mbps, Isolation 1.5 kV   |
| Serial Lines   | 1× RS232 (Tx, Rx, RTS, CTS, GND)<br>1× RS485 (A(-), B(+), GND)<br>(10-pin terminal block)        |
| I / O          | 1× Digital Input<br>1× Digital Output<br>(10-pin terminal block)                                 |
| Reset Button   | Reboot / Factory reset   |
| LED Indicators | System, 3-level signal strength, Data activity, SIM1/SIM2 status, 2G/3G/4G technology, User, ETH |

| Bluetooth - optional |  |
|----------------------|--|
| Antenna              | Shared R-SMA WiFi antenna connector  |
| Version              | Bluetooth 5.1, class 1 (Bluetooth Low Energy), Bluetooth®SIG Qualification |
| Data rate            | 1 Mbps (GFSK), 2 Mbps (π/4-DQPSK), 3 Mbps (8-DPSK)                         |

| Environmental            |   |
|--------------------------|---|
| Power Supply             | 9 – 36 V DC (2-pin terminal block)  |
| Consumption              | With WiFi: Idle 2.5 W / Average 4 W / Maximum 11 W <a href="#">HW Rev 1.0</a><br>With WiFi: Idle 2.6 W / Average 4.3 W / Maximum 5.8 W <a href="#">HW Rev 2.0</a> |
| Sleep Mode               | Yes, 100 mW <a href="#">HW Rev 1.0</a> , 20 mW <a href="#">HW Rev 2.0</a>   |
| Operating Temperature    | -40 to +75 °C   |
| Storage Temperature      | -40 to +85 °C   |
| Humidity                 | 5 to 95 %   |
| IP Cover                 | IP30  |
| Physical Characteristics |   |
| Dimensions               | 31.2 × 94 × 129 mm  |
| Enclosure                | Metal Case, Grounding Screw   |
| Mounting                 | Wall Mount kit, DIN Rail  |
| Weight                   | ICR-3241 - 457g<br>ICR-3241W - 477g   |

| WiFi - optional |   |
|-----------------|---|
| Antenna         | 2× R-SMA connectors, 2×2 MIMO                                 |
| Standards       | IEEE802.11 ac/a/b/g/n 2.4 GHz / 5 GHz                         |
| Security        | WEP, WPA, WPA2, WPA3, 802.1X                                  |
| Modes           | Access Point (unlimited clients), Station, Multirole STA & AP |

| GNSS - optional      |                                     |
|----------------------|-------------------------------------|
| Antenna              | Active, 1× SMA connector            |
| Systems              | GPS, GLONASS, BeiDou, Galileo, QZSS |
| Protocol             | NMEA                                |
| Ac Time-to-First-Fix | Cold 35 s, Warm 26 s                |

| Standards & Regulations    |   |
|----------------------------|---|
| 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                     | UL/EN/AS/NZS 62368-1  |
| Mechanical                 | EN 60068-2-27, 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                           |
| Transportation             | E-Mark, EN 45545-2  |
| Railway                    | EN 50155 compliant  |
| Carrier Approval           | Verizon, AT&T, FirstNet, T-Mobile   |
| National                   | FCC, IC   |
| Environmental              | REACH, RoHS3 and WEEE compliant   |
| Cellular Module Approvals* | Regulatory: GCF, FCC, PTCRB, IC<br>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.

| 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)<br>VPN Tunneling – WireGuard, OpenVPN, *EasyVPN, IPsec with IKEv1 and IKEv2, GRE, L2TP, PPTP<br>Authentication – RADIUS, TACACS+, *SCEP<br>Encryption – DES, 3DES, AES, RSA, MD5, SHA |
| Firmware Management               | Automatic firmware updates – server, locally via LAN or remotely via WAN<br>Over-the-Air cellular module firmware updates  |
| Diagnostic/Log                    | Status – Signal Strength, Data Usage, Detailed Long Term Statistics<br>One CLICK report – Current Configuration, Factory Identification, Routing Table<br>Log – System Log, Reboot Log, Kernel Log<br>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)<br>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<br>WebAccess/VPN – Advanced Secure Networking Platform  |

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

| Cellular Interface    |   |
|-----------------------|---|
| SIM Slots             | 2x SIM (Mini SIM – 2FF) with cover, eSIM ready  |
| Antennas              | 2x SMA connector (1x Main, 1x Diversity)  |
| LTE Parameters        | Cat. 4, 3GPP E-UTRA Release 11<br>Supported FDD frequencies: B2 (1900 MHz), B4 (1700 MHz), B5 (850 MHz), B12, B13, B14 (700 MHz), B66 (1700 MHz), B71 (600 MHz)<br>Transfer rate: 150 Mbps (DL), 50 Mbps (UL) |
| HSPA+/UMTS Parameters | Supported frequencies: B2 (1900 MHz), B4 (1700 MHz), B5 (850 MHz)<br>Transfer rate: 4.2 Mbps (DL) / 2.2 Mbps (UL)   |

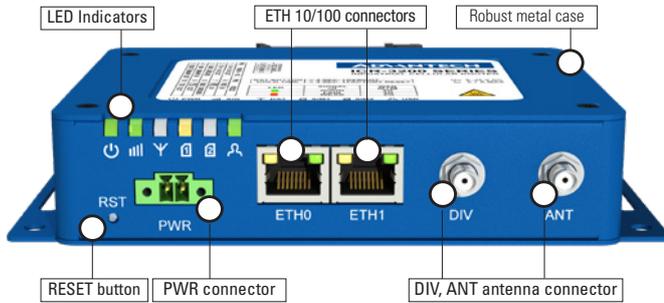
## Accessories

| Part Number        | Description                                | Included in the package | Optional |
|--------------------|--|-------------------------|----------|
|                    | Wall mount kit                             | ✓                       |          |
| BB-DIN-ICR32       | DIN clip                                   | ✓                       |          |
| BB-CON-ICR32-10    | Serial / IO connector                      | ✓                       |          |
| BB-CON-WR2         | PWR connector                              | ✓                       |          |
| ANT-LTE5G-025      | Antenna 5G/LTE Terminal                    |                         | ✓        |
| BB-AW-A2458G-FSRPK | Antenna Wi-Fi 2.4 & 5 GHz                  |                         | ✓        |
| BB-AP-AGNSS-SMA    | Ant GPS/GLONASS, magnetic, cable 3m, SMA-M |                         | ✓        |
| BB-RPS-v2-WR2-EU   | Wall mount Power Supply 12V/1A, EU plug    |                         | ✓        |
| BB-RPS-v2-WR2-UK   | Wall mount Power Supply 12V/1A, UK plug    |                         | ✓        |
| BB-RPS-v2-WR2-US   | Wall mount Power Supply 12V/1A, US plug    |                         | ✓        |
| BB-RPS-v2-WR2-AUS  | Wall mount Power Supply 12V/1A, AUS plug   |                         | ✓        |

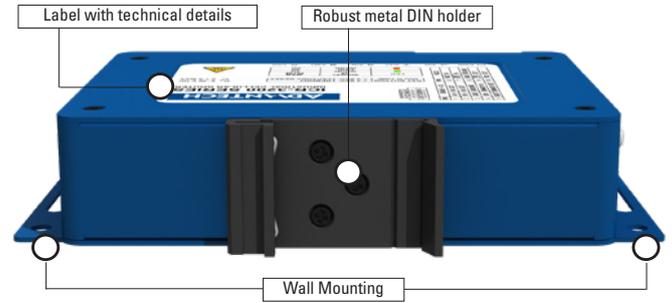
For more accessories (Antennas, Power Supplies) visit [www.advantech.com](http://www.advantech.com)

### Views

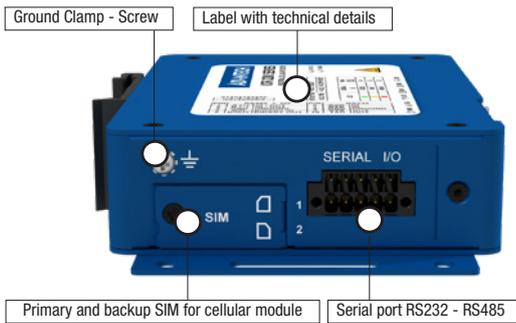
#### FRONT VIEW



#### REAR VIEW



#### LEFT SIDE VIEW



#### RIGHT SIDE VIEW

ICR-3241 - VERSION WITHOUT WIFI AND GPS



#### LEFT SIDE VIEW ROUTER WITHOUT SIM COVER

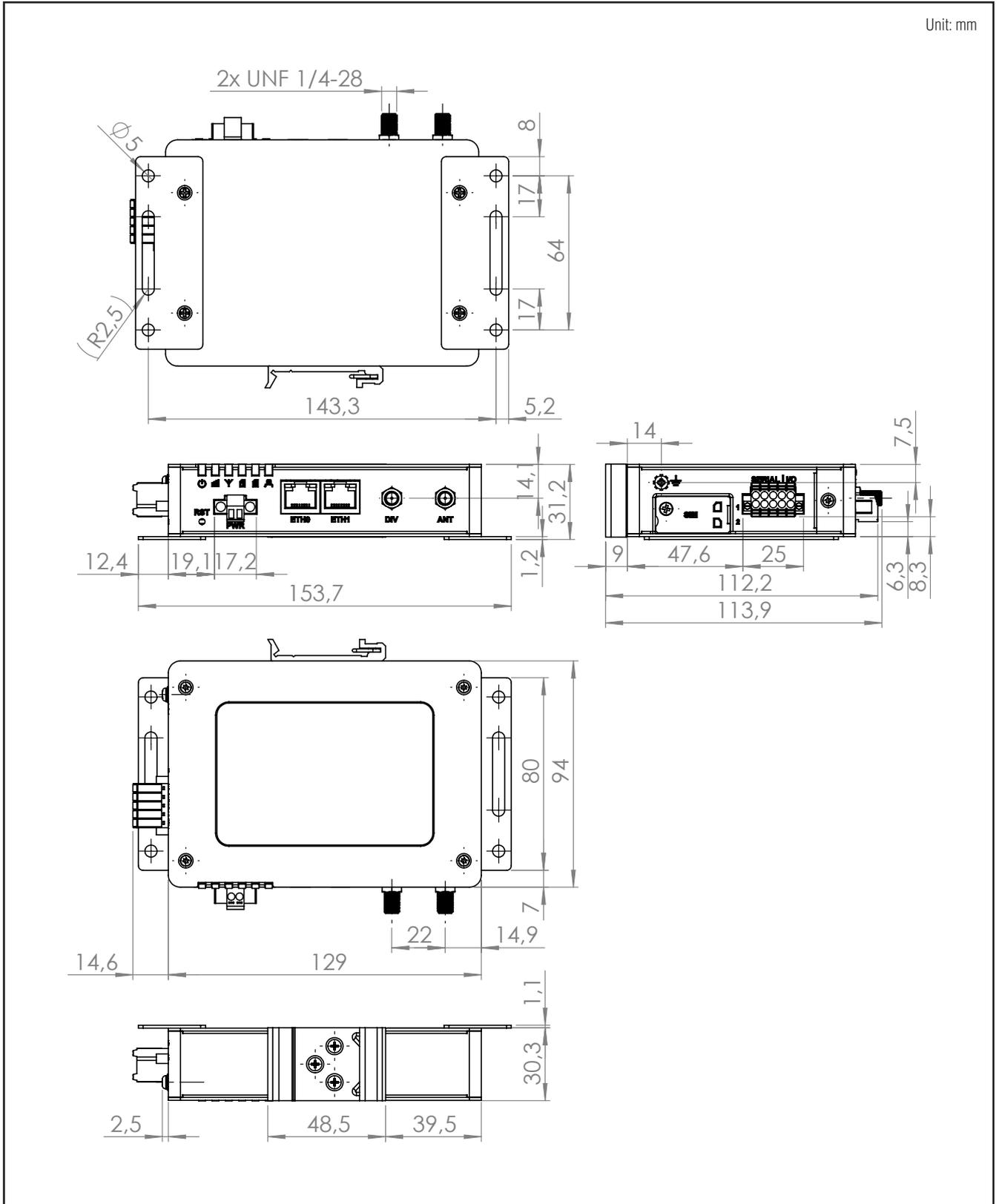


#### RIGHT SIDE VIEW

ICR-3241W - VERSION WITH WIFI AND GPS



### Dimensions - Technical Drawing



### Dimensions - Technical Drawing

