# Cellular Routers & Gateways
## for Industrial IoT & Enhanced Networking
### 5G / 4G LTE / 3G HSPA+ / UMTS / EDGE / GPRS

- Key features & Networking overview
- Platforms overview
- Detailed selection guide
- Management software
- Case studies



**Newly 2023 updated**

**ADVANTECH iAutomation**
**Premier Partner**

# Cellular Routers & Gateways

Vertrieb durch **AMC**
AMC – Analytik & Messtechnik GmbH Chemnitz
Heinrich-Lorenz-Str. 55       Tel.: +49/371/38388-0
09120 Chemnitz                Fax: +49/371/38388-99
E-Mail: info@amc-systeme.de   Web: www.amc-systeme.de

## 5G / 4G LTE / 3G HSPA+ / UMTS / EDGE / GPRS Cellular Routers & Gateways
### ... features and platforms overview...

### Flexible, effective and secure networking

Advantech routers enhanced functionality incorporates self-diagnostics and an HW watchdog to ensure secure and consistent operation and ultra-reliable wireless connections. With multi-SIM card holders and automatic failover routers provide wireless redundancy for critical applications along with SMS/email messaging and control capability for remote alerts and reset. They support the most commonly used LAN/WAN network protocols. The goal is flexibility, effectiveness, and security in a large variety of applications.

Advantech routers are based ICR-OS operating system (Linux Kernel) that combines the simplicity of a web-based configuration with the flexibility of an open platform that allows the development of custom configuration scripts and RouterApps (software User Modules). ICR-OS serves also as a gate for router integration into additional monitoring and security software platforms – WebAccess/DMP, WebAcces/VPN, and R-SeeNet. Those platforms enhance router security of communication, remote management, and hardware/software monitoring while increasing significantly user comfort and stability in operated networks.

**ICR-OS**

### Networking
- DHCP: automatic IP addressing in LAN network
- NAT/PAT: IP address and port translation
- VRRP: virtual backup router function
- DynDNS client: access to the dynamic IP address
- VLAN 802.1Q: virtual LAN
- QoS: quality of service
- PPPoE Bridge: PPP over Ethernet Bridge mode
- NTP client, NTP server: time synchronization
- Dynamic routing protocols: BGP, OSPF, RIP, IS-IS, NHRP
- MODBUS RTU/TCP gateway and mapping: convert data from RTU to TCP/IP format
- Backup routes: back up of the primary connection with alternative connections to the Internet (mobile network) or enabling Multiple WANs mode
- Dual stack IPv4 and IPv6 support
- Load balancing: the weight for every router interface can be set

### Multiple SIM for carrier failover
- Back-up by switching between up to 4 independent mobile carriers according to router model
- Switch when data limit is exceeded, when roaming is detected or by any other programmable option
- eSIM support

### VPN Tunneling & Security
- IPSec, OpenVPN, PPTP, L2TP, EasyVPN, GRE, WireGuard
- Authentication by certificates, shared keys, name/password, RADIUS, 2FA
- HTTPS, SSH, SFTP, DMZ
- Firewall: filtering of addresses, ports, protocols
- TPM secure chip for v4 router platform (5G and LTE Advanced)
- PCI DSS compliance

### Remote Router Supervision & Mass Network Management
- HTTP/HTTPS, Telnet/SSH for local and remote configuration and firmware updates via WAN, locale configuration and firmware updates via LAN
- Schedule automatic configuration and firmware updates from your FTP/HTTP servers, Backup & Restore configuration
- Up to 4 independent configuration profiles can be stored and remotely switched using scripts, SMS messages, I/O, etc.
- Additional management, monitoring and security software platforms WebAccess/DMP2, WebAccess/VPN and R-SeeNet

**WebAccess/DMP2**   **WebAccess/VPN**   **R-SEENET**

| Hardware Platform v4 | Hardware Platform v3 | Hardware Platform v2i |
|---|---|---|
| High Speed 4G/5G Routers & Powerful Edge Computing Gateways | Powerful Industrial 4G Routers & IoT Gateways | Industrial 4G Routers & IoT Gateways |
| A lot of power for all upcoming challenges | Powerful and proven industrial design | Great value for a number of applications |
| Quad-Core CPU 1.2 GHz | CPU 1 GHz | CPU 600 MHz |
| RAM 1024 MB | RAM 512 MB | RAM 128 MB |
| 5 × 10/100/1000 Ethernet, PoE, SFP, RS232, RS485, CAN, GPS, I/O, WiFi | 2 - 5 × 10/100 Ethernet, PoE, RS232, RS485, GPS, I/O, WiFi, Bluetooth | 1 - 4 × 10/100 Ethernet, RS232, RS485, I/O |
| RouterApp supported - 838 MB space | RouterApp supported - 128 MB or 838 MB space according to model specification | RouterApp supported - 12 MB space |
| **WebAccess/DMP2   WebAccess/VPN** Supported | | |
| ICR-OS  RouterApp  docker  Node-RED  python | ICR-OS  RouterApp  docker  Node-RED  python | ICR-OS  RouterApp  python |

### Diagnostics
- 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)
- SNMP: router diagnostics, communication with I/O and MBUS
- LED indication: signal strength, connection status, ports, customer's application LED

### Event Engine and SMS & E-mail Info
- StartUp script & Up/Down script: possibility to customize rules based on digital inputs status, network parameters, data usage, timer, power, device temperature etc.
- Information about status, connection or disconnection and many other parameters
- SMS control: on/off connection, switching SIM, router profile, I/O
- SMS communication: AT commands (RS232 and TCP/IP), I/O or HTTP
- SNMP traps

### Application Development

Based on Linux Kernel Advantech cellular routers & gateways combines the simplicity of a web-based configuration with the flexibility of an open platform that allows the development of custom configuration scripts and RouterApps (software User Modules).

- Open Linux, BASH, C/C++ supported
- Python (for v3 and v4 platform)
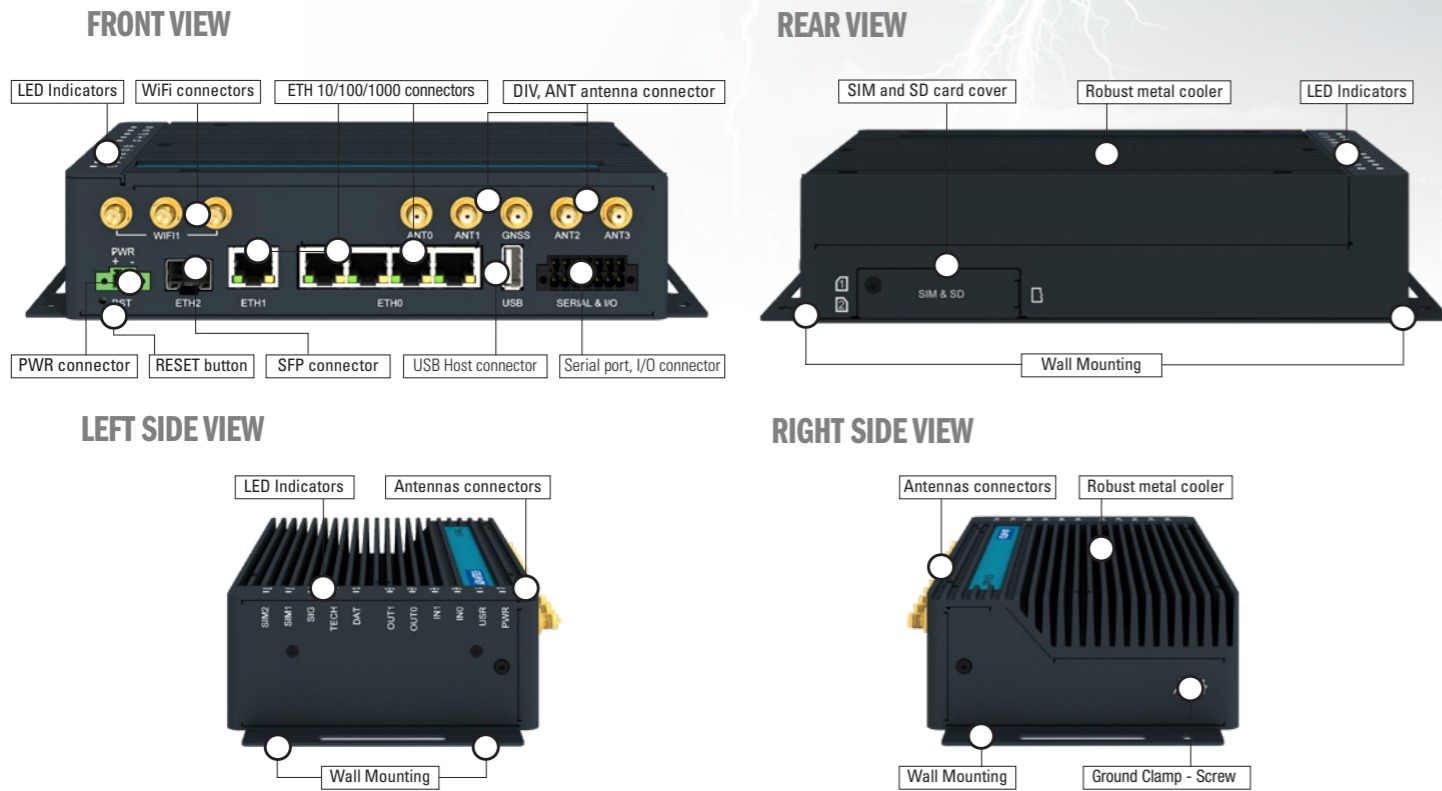- Node-RED (for v3 and v4 platform)
- Docker

**RouterApp   python   Node-RED**

# ICR-4400

## Ultra High-Speed Router & Powerful Edge Computing Gateway

The **new router platform "v4"** serving as 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 **TPM 2.0** secure chip inside and Tamper Button that ensures safe use in critical infrastructure systems. The **ICR-4400** router models are powered by the **ICR-OS** Linux operating system that provides a wide range of standard and enhanced networking features. A secure web interface allows users to configure and manage routers from remote locations, routers support multiple configuration profiles, automatic firmware updates, and many more. As **ICR-4400** is ready to operate in a standard and highly customized software environment as well it is truly born as a powerful edge computing gateway for today's world. Operators are free to use standard web configuration, Linux scripts, AT commands and add new features by additional software applications called **Router Apps** (User Modules). There is an existing free library of **Router Apps** or the user may create its own app using **Advantech SDK**. The gateway can easily run applications like **Node-RED** or **Docker** (planned) that open the way to a multi-container world.

The **ICR-4400** is designed and manufactured for use in tough environmental conditions. Specifications include a wide operating temperature ranges from **-40 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-4400** offers to the user for connection **five Ethernet 10/100/1000 Mbps** (1 × independent and 4 × switch), optical connectivity when **SFP cage** (independent port) used, one **USB host 2.0**, **microSD reader**, serial lines **RS232** and **RS485**, **CAN Bus**, two binary inputs, and two binary outputs. The cellular router models contain two SIMs readers which are placed on the rear side of the device.

### FRONT VIEW



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

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

Wall Mounting

### LEFT SIDE VIEW



LED Indicators | Antennas connectors

Wall Mounting

### RIGHT SIDE VIEW



Antennas connectors | Robust metal cooler

Wall Mounting | Ground Clamp - Screw

There is also the possibility to use one **eSIM** as the chip on the device in projects. **ICR-4400** has two mPCIe connectors that can be used for optional two WiFi modules. Electronics inside devices are well protected by robust metal casing for a wall mount (DIN mount is optional). **ICR-4400** is easy to be managed by using **WebAccess/DMP** tool - full-featured cloud-based management for provisioning and monitoring of routers simplifying operation mainly in mass deployments. Routers support also the connection to **WebAccess/VPN** that is a perfect way to create secure virtual private networks on the Internet.

### ICR-4400 available models

Routers are now available in **4 production models** – 5G models **ICR-4453** and **ICR-4461**, LTE Advanced model **ICR-4434**, and **ICR-4401** without cellular connectivity onboard. **ICR-4453** and **ICR-4461** models development was motivated by the raising of **5G networks** globally. We responded by an **ultra-high-speed 5G NR** (New Radio) **router & powerful edge computing gateway** that is focused on global market challenges. With the **5G „gigabit" speed**, **low latency**, and guaranteed quality (SLA) of connectivity is a real step forward to a massive IoT and Enhanced mobile broadband (eMBB) applications - Mobile Internet access, Camera and security systems, industrial systems, and many other high data demanding applications. The router supports fallback via LTE (LTE-A Pro) and 3G networks for areas where 5G coverage is not well developed yet.

## Key Product Features in glance:

- Quad-Core CPU with 1 GB RAM
- 2× SIM, eSIM Ready, TPM 2.0
- 5× Gigabit Ethernet (Optional 4× PoE PSE)
- SFP Fibre port (up to 10 Gbp/s), GNSS Receiver
- RS232, RS485, CAN BUS, 2× DI, 2× DO, USB Host, Micro SD Card
- Robust metal cover with wall mount options
- Wide operational temperature range
- Optional Dual-Band Wi-Fi

### ICR-4453

- 5G NR Cellular Connectivity, Sub-6 GHz
- 3GPP Release 15, Support both NSA and SA modes
- EMEA, NAM

### ICR-4461

- 5G NR Cellular Connectivity, Sub-6 GHz
- 3GPP Release 15, Support both NSA and SA modes
- Global, NAM

### ICR-4434

- LTE-A Cat.12 worldwide connectivity with 3G fallback



The next model is **ICR-4434** - high speed **4G router & powerful edge computing gateway** focused on the global market. The **LTE-A Cat.12** worldwide connectivity with 3G fallback brings an ideal technology mix for high-demand data transfer in IoT/M2M applications. Due to the high-speed data transfer of up to **600 Mbps (download)** and up to **150 Mbps (upload)**, this router is an ideal solution for specialized M2M devices and IIoT. It serves well also for the wireless connection of traffic and security camera systems, individual computers, LAN networks, industrial systems, and various self-service terminals.

The **ICR-4401** provides the fast and stable connection to customer networks where using wired interfaces is required only. It might be interesting for example from the security points of view where the router can separate LAN's in the customer network and provide at the same time excellent interoperability with other Advantech ICR routers using the same **ICR-OS** firmware and advanced security and monitoring tools.

# ICR-2700 Libratum, ICR-2800
## Successors of v2 Routers

## Product Features:

- LTE Cat.4 with 3G/2G fallback
- 1.3 GB eMMC storage to host customer SW applications
- 2× SIM with cover, eSIM ready, GNSS (ICR-2800 only)
- 2× Serial RS232/RS485 (ICR-2800 only)
- 2× Ethernet 10/100, USB Host 2.0

- Optional Metal or Plastic case
- DIN Rail mounting
- Wide operational temperature range
- Backup real time clock
- Sleep mode

**ICR-2700 Libratum** and **ICR-2800** are fully compatible enhanced successors of Advantech´s balanced-features cellular routers LR77v2 and LR77 v2 Libratum. Interfaces offer even more features and improvements such as a USB port, more detailed LED indication, and mainly more powerful CPU and amply of data storage to ensure a long lifecycle (software updates) with broad software customization possibilities for the user. Routers has also a TPM 2.0 chip (Trusted Platform Module) onboard verifying router integrity to provide trusted solutions as a response to increasing cybersecurity demands in many industrial and public sectors. Routers have the same dimensions as their v2 platform predecessors.
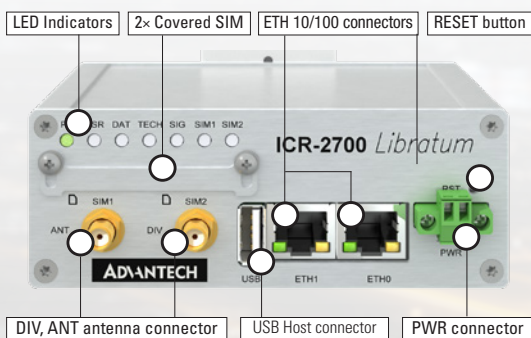
The hardware of routers is the same for both routers and includes **600 MHz CPU based** on **ARM architecture** and **128 MB of RAM**. Along with **4 GB** memory and **897 MB** for **Router Apps** and **512 MB** for customer data you get the device you might use as a cellular communication device or IoT gateway that moves the intelligence at the edge of your network. The cellular routers are equipped with the most popular interfaces that include 2 × Ethernet 10/100 ports with two independent LANs/IP addresses, 1 × USB 2.0 host port, and 2 × plate covered SIM card holders for automatic failover to an alternate service provider. **ICR-2800** extends the application possibilities of **ICR-2700** for serial interfaces and a large number of digital IOs.

Routers are powered by well-known Linux-based Advantech´s operating system ICR-OS. A secure web interface allows users to configure and manage both routers from remote locations. Routers support real-time data encryption and establishing of VPN tunnels using IPsec, WireGuard, OpenVPN, GRE, etc. It supports standard and advanced networking features like DHCP, NAT, NAT-T, DynDNS, NTP, VRRP, control by SMS, and numerous other functions.

Both routers are ready to easily install individually and in mass deployments scenarios too by using a full-featured configuration and monitoring software tool WebAccess/DMP. Safe remote VPN access to customer devices and PCs connected to routers through Internet can be administrated by additional software WebAccess/VPN.
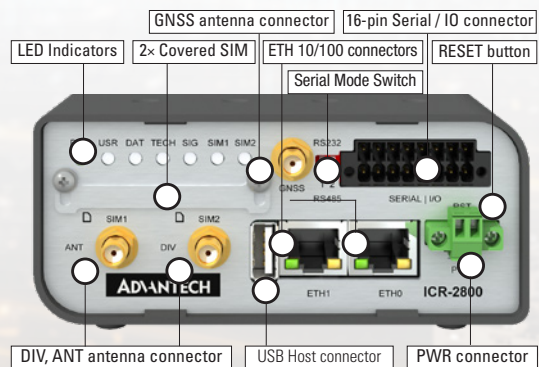
## ICR-2700 Libratum

### FRONT VIEW
#### METAL VERSION



LED Indicators | 2× Covered SIM | ETH 10/100 connectors | RESET button

DIV, ANT antenna connector | USB Host connector | PWR connector

### REAR VIEW
#### METAL VERSION



Ground clamp

DIN Holder

## ICR-2800

### FRONT VIEW
#### PLASTIC VERSION



GNSS antenna connector | 16-pin Serial / IO connector

LED Indicators | 2× Covered SIM | ETH 10/100 connectors | RESET button

Serial Mode Switch

DIV, ANT antenna connector | USB Host connector | PWR connector

### REAR VIEW
#### PLASTIC VERSION



DIN Holder
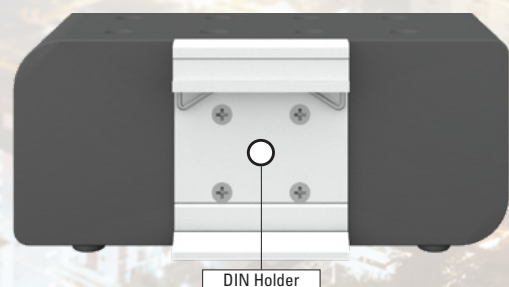
# ICR-2000, ICR-2400, ICR-2500, ICR-2600 Entry-Level 4G Routers

## Product Features:

- LTE Cat. 4 with 3G/2G fallback
- up to 2× SIM for redundancy
- up to 4× Ethernet 10/100 Mbps
- optional 1× RS232, 1× RS485

- 1× DI, 1× DO
- Wide operational temperature range
- Wall and DIN mount options
- Linux based OS & SW customization

Industrial cellular LTE router models **ICR-2000**, **ICR-2400**, **ICR-2500** and **ICR-2600** are designed for wireless communication in cellular 4G/LTE Cat.4 networks with fall back to older 3G/UMTS/HSPA+ and 2G/GPRS/EDGE cellular networks. **ICR-2000**, **ICR-2400**, **ICR-2500** and **ICR-2600** are designed for different LTE categories (Cat. 4, Cat M1/NB-IoT, Private LTE bands, 450 MHz). Depended on a specific router model providing LTE connectivity for the diverse needs of modern communication systems.

The differences between the models are in a number of 10/100 Ethernet ports and serial lines for connection. The router **ICR-2000** is equipped with one 10/100 Ethernet port and one digital input and output (I/O). The router **ICR-2400** is equipped with two independently configurable 10/100 Ethernet ports (LAN or WAN), 1× serial port RS232, 1× RS485, and with one digital input and output (I/O). The router **ICR-2500** is equipped with four 10/100 Ethernet ports, and with one digital input and output (I/O). In compering with **ICR-2500**, the **ICR-2600** has an extra RS232/RS485 serial port. All routers support establishing of a VPN tunnel and various protocols to ensure safe communication. Routers provide diagnostic functions which include automatic monitoring of wireless and wired connections, automatic restart in case of connection loss, and a hardware watchdog that monitors the state of the router. Routers are based on the **ICR-OS** operating system (Linux platform) that enables wide possibilities of programming customer SW applications in Python, and C/C++. There is also possible to benefit from the existing **Router Apps** (User modules) library with ready-to-use software developed to enhance specific router functionality including industrial protocol conversions and support of IoT platforms such as MS Azure, Cumulocity, and others.

## FRONT VIEW
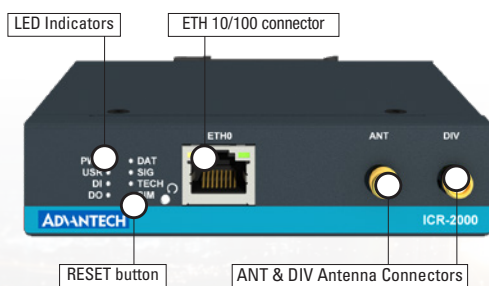


## LEFT SIDE VIEW
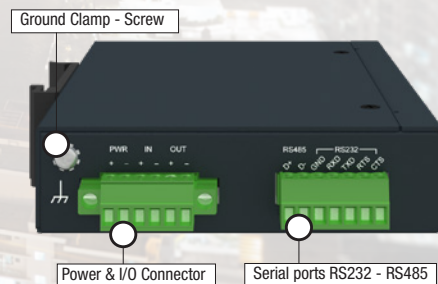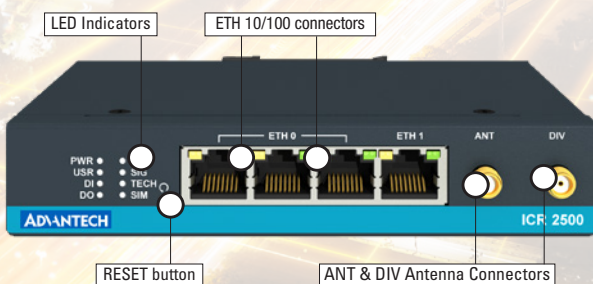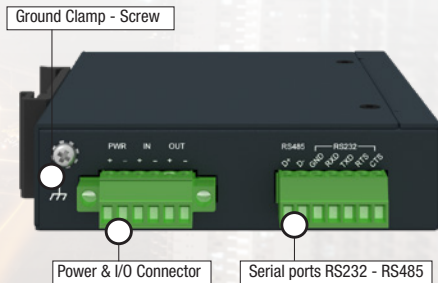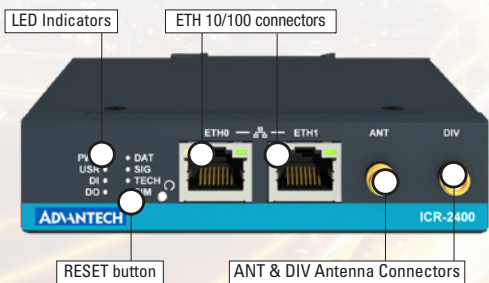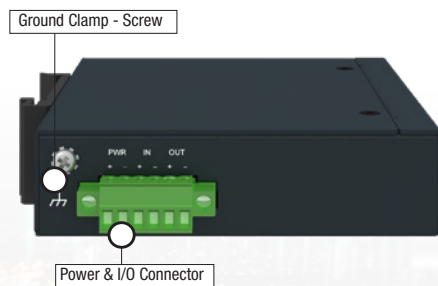
# ICR-3200

## Industrial IoT 4G LTE Router & Gateway

### Product Features:

- 4G LTE Cat.4, Cat. M1 VPN Gateway for Industrial IoT applications
- Powerful CPU with 1.3 GB storage to host customer SW applications
- 2× SIM with cover, eSIM ready
- 2× Ethernet 10/100, 1× RS232, 1× RS485 and I/O
- Optional Wi-Fi 802.11ac using MIMO technology
- Optional Bluetooth v5.1 (class 1)
- Optional GNSS receiver
- Robust metal cover with DIN and Wall mount options
- Operational temperature range from -40 °C to +75 °C
- Backup real time clock
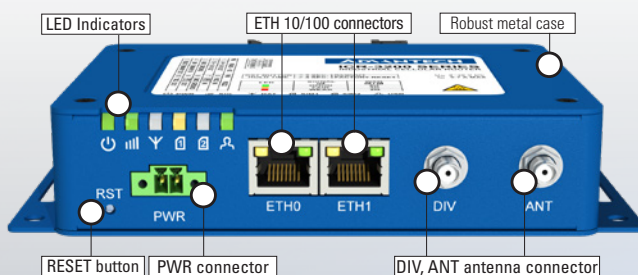- Sleep mode & Power ignition

The **ICR-3200** LTE gateway is the perfect way to connect IP or serial devices to a cellular network. Industrial M2M and IoT applications include kiosks, industrial PCs, HMIs, traffic controllers, meters, 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 such as CCTV or public Wi-Fi hotspots. LTE Cat M1 version of the router use a new cellular technology specifically designed for the needs of applications targeting the Internet of Things (IoT) or machine-to-machine (M2M) communications.

In addition to its two independent or switched Ethernet ports, **serial ports RS232** and **RS485**, ICR-3200 has built-in digital I/O connectivity, backup real-time clock and sleep mode support. The device has two SIM readers protected by metallic cover for carrier failover redundancy. As an addition the router is ready to use internal eSIM. Optional built-in GNSS chipset provides information about the accurate position of the router. An optional built-in Wi-Fi module and Bluetooth v5.1 (class 1) modules are also available, with 802.11a,b,g,n,ac modes.
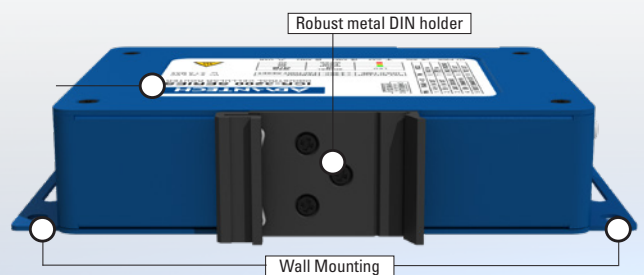
The router supports VPN tunnel creation using various protocols to ensure safe communications. The router provides diagnostic functions which include automatic monitoring of the wireless and wired connections, automatic restart in case of connection losses, and a hardware watchdog that monitors the router status.

The ICR-3200 places intelligence at the network edge with an extremely powerful **Cortex A8 CPU** at **1 GHz**, **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.

**ICR-3200** is easy to install using **WebAccess/DMP**, a full featured configuration and monitoring tool. Our VPN portal **WebAccess/VPN** makes it easy to build private network. The router also supports additional traffic and health monitoring software **R-SeeNet**.

### FRONT VIEW



- LED Indicators
- ETH 10/100 connectors
- Robust metal case
- RESET button
- PWR connector
- DIV, ANT antenna connector
- RST
- PWR
- ETH0
- ETH1
- DIV
- ANT

### REAR VIEW



- Robust metal DIN holder
- Wall Mounting

### LEFT SIDE VIEW



- Ground Clamp - Screw
- Label with technical details
- SERIAL I/O
- Primary and backup SIM for cellular module
- Serial port RS232 - RS485

### RIGHT SIDE VIEW



- WiFi2
- GNSS
- WiFi1
- GPS, WiFi antennas
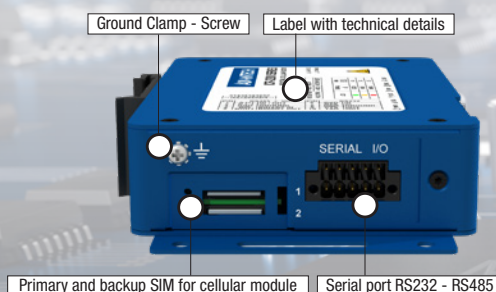
# SmartFlex, SmartMotion

## ... more power, more features, more ideas

**lte**

## Product Features:

- Powerful CPU to support high demand customer applications
- Extended operational temperature range from -40 °C to +75 °C
- 10-60 V DC, reverse polarity voltage protection
- Flexible port options for SmartFlex router family
- Twin cellular module capability for SmartMotion router family

- GPS and GLONASS support
- MicroSD card holder
- Low power mode for solar and battery power applications
- PoE PD, PoE PSE, In/Out, USB Host
- Advanced security features (VPN, firewall etc.)

The **SmartFlex** and **SmartMotion** cellular routers provide secure Internet connectivity for devices and LANs via cellular networks. Routers provide **transfer speeds up to 50 Mbit/s** and **download speeds of up to 100 Mbit/s** meeting the high demand required for video transfer.
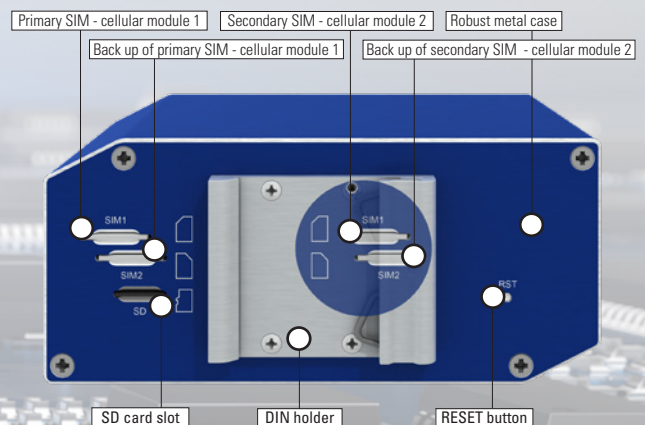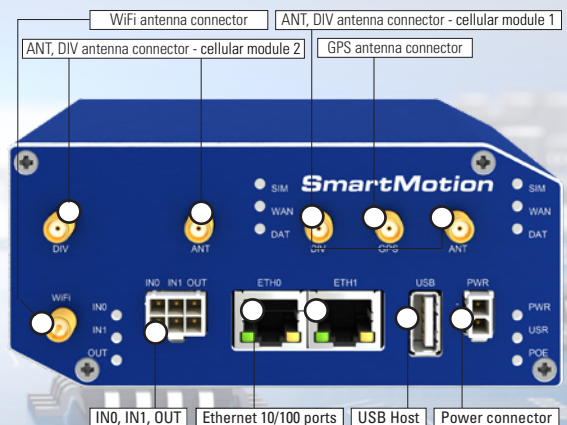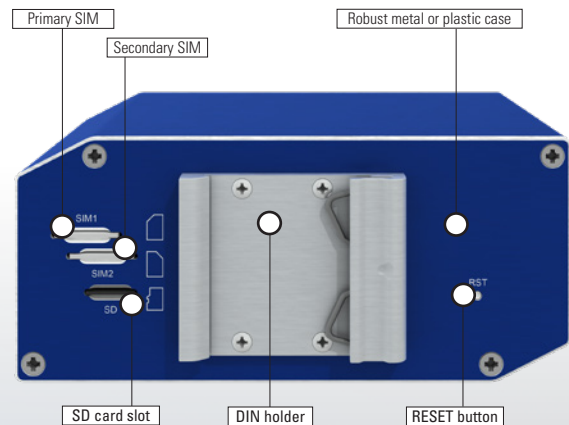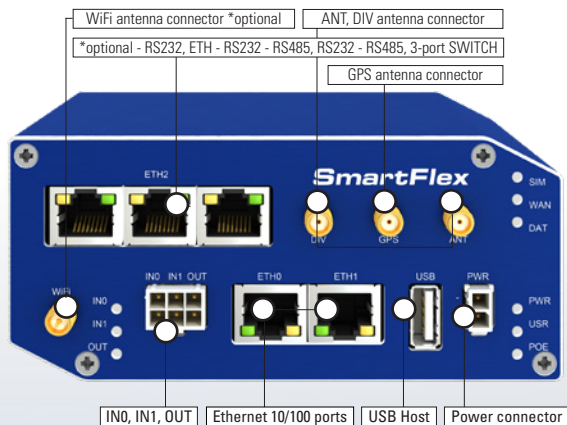
The **SmartFlex** and **SmartMotion** place intelligence out at the network edge with an extremely powerful **Cortex A8 CPU at 1GHz**, **256 MB flash memory**, **512 MB RAM**, and **128kB M-RAM** providing full support for **4G/LTE speeds** and applications.
A secure web interface allows users to configure and manage routers from remote locations. Upgrade of configuration or firmware from the operator's central server allowing simultaneous mass reconfiguration of every router on the network.

The **SmartFlex** and **SmartMotion** standard hardware configuration include 2× Ethernet 10/100 ports with 2 independent LANs/IP addresses. The standard configuration also includes 1× USB host port, 1× microSD card holder, 2× SIM cardholders (4 SIM card holders for SmartMotion) for automatic failover to an alternate service provider/providers, 2× binary inputs (I/O), 1× binary output (I/O) and onboard GPS (GPS missing on SmartMotion model ST355).
For **SmartFlex** there are available optional hardware boards that extend flexibility in the applications: optional board one offers extra 3× ETH 10/100 ports (the router can be configured with up to 5 total Ethernet ports and 3 independent LANs/IP addresses than) or optional board two with 1× ETH 10/100 – 1× RS232 – 1× RS485 (isolation strength up to 2.5kV) or optional board three with 1× RS232 – 1× RS485 or RS232.  Both routers are based on ICR-OS operating system with full features onboard.

Routers can be connected to software platforms **WebAccess/DMP**, **WebAccess/VPN** and **R-SeeNet**.



WiFi antenna connector *optional | ANT, DIV antenna connector
*optional - RS232, ETH - RS232 - RS485, RS232 - RS485, 3-port SWITCH
GPS antenna connector
IN0, IN1, OUT | Ethernet 10/100 ports | USB Host | Power connector



Primary SIM | Robust metal or plastic case
Secondary SIM
SD card slot | DIN holder | RESET button



WiFi antenna connector | ANT, DIV antenna connector - cellular module 1
ANT, DIV antenna connector - cellular module 2 | GPS antenna connector
IN0, IN1, OUT | Ethernet 10/100 ports | USB Host | Power connector



Primary SIM - cellular module 1 | Secondary SIM - cellular module 2 | Robust metal case
Back up of primary SIM - cellular module 1 | Back up of secondary SIM - cellular module 2
SD card slot | DIN holder | RESET button

| | Entry Level Routers Basic Interfaces | Industry Popular Port Options | Enhanced & Flexible | LAN Wired Routers | Dual LTE module routers for critical applications | Railway Router EN 50155 |
|---|---|---|---|---|---|---|
| **Number of interfaces and enhancements** | 1 - 2× ETH, RS232 | 2-4× intefaces, ETH, RS232, RS485, I/O, WiFi, 1 - 2 SIM | 2-10× intefaces, ETH, RS232, RS485, USB, CAN, I/Os, WiFi | 2-10× intefaces, ETH, RS232, RS485, USB, CAN, I/Os, WiFi | 3× interfaces ETH, USB, 4 SIM | Rolling stock certified router |

### Platform v4

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

Quad-Core CPU 1.2 GHz
RAM - 1024 MB
eMMC - 4096 MB
(838 MB for Router Apps, 512 MB for customer data)
ICR-OS, SW customization,
Router App, Python, Node-RED, Docker, Third Party Apps

| Enhanced & Flexible | LAN Wired Routers |
|---|---|
| **ICR-4400 Series** | **ICR-4400 LAN** |
| 5G / LTE-A Cat.12 | Wired |
| 5× Gig ETH, SFP, USB, SD card, 1× RS232, 1× RS485, | 5× Gig ETH, SFP, USB, SD card, 1× RS232, 1× RS485, |
| 1× CAN bus, 2× DI + DO, GPS, Optional MIMO WiFi, | 1× CAN bus, 2× DI + DO, Optional MIMO WiFi, |
| Optional 4× PoE PSE | Optional 4× PoE PSE |
| **ICR-4453 - EUROPE, NAM (5G)** | **ICR-4401 - Global** |
| **ICR-4461 - Global, NAM (5G)** | |
| **ICR-4434 - Global (LTE-A Cat.12)** | |

### Platform v3

**Powerful Industrial 4G/LTE Routers & IoT Gateways**

CPU 1 GHz
RAM - 512 MB
MRAM - 128 KB
NOR Flash - 256 MB (SmartFlex, SmartStart, SmartMotion, ICR-3800)
(128 MB for Router Apps, 128 KB for customer data)

eMMC - 4096 MB (ICR-3200, BB-SL305)
(838 MB for Router Apps, 512 MB for customer data)
ICR-OS, SW customization, Router App, Python, Node-RED

| SmartStart series | ICR-3200 series | SmartFlex series | SmartFlex LAN | SmartMotion series | ICR-3800 series |
|---|---|---|---|---|---|
| LTE Cat.4 | LTE Cat.4 | LTE Cat.3 / Cat.4 | Wired | LTE Cat.3 | LTE Cat.4 |
| 2× SIM, 1× ETH, 1× RS232, DI+DO, Optional WiFi | 2× SIM, 2× ETH, SD card, Optional MIMO WiFi, Bluetooth and GPS | 2-5× ETH, USB, SD card, Optional Isolated serial RS232, RS485 ports, GPS, Optional WiFi, | 5× ETH, USB, SD card, DI+DO, Optional WiFi, Optional PoE PSE, PoE PD | Dual Module, 2× ETH, 4× SIM, USB, SD card, GPS, Optional WiFi, Optional PoE PSE, PoE PD | 2× ETH, USB, SD card, GPS, Optional PoE PD |
| **BB-SL305 - EMEA** | **ICR-3231 - EMEA** | Optional PoE PSE, PoE PD | **BB-SR300 - Global** | **BB-ST352 - EMEA, LTE 450** | **ICR-3831 - EMEA** |
| | **ICR-3241 - NAM** | **BB-SR303 - EMEA** | | **BB-ST355 - EMEA** | |
| | **ICR-3232 - AUS** | **BB-SR304 - EMEA, APAC, LATAM** | Wired | | |
| | **LTE Cat. M1 & NB IoT** | **BB-SR305 - NAM** | 2× ETH, 1× RS232, 1× RS485, DI+DO, Optional MIMO WiFi, Bluetooth | | |
| | 2× SIM, 2× ETH, 1× RS232, 1× RS485, DI+DO | **BB-SR308 - AUS** | **ICR-3201 - Global** | | |
| | **ICR-3211B - NAM, EMEA** | **BB-SR307 - LTE 450** | | | |
| | | **BB-SR309 - Korea** | | | |
| | | **BB-SR310 - Global** | | | |

### Platform v2i

**Industrial 4G/LTE Routers**

CPU 600 MHz
RAM - 128 MB
NOR Flash - 64 MB
(12 MB for Router Apps, 2 MB for customer data)
ICR-OS, SW customization, Router App

| ICR-2000 series | ICR-2400 series | ICR-2500 series |
|---|---|---|
| LTE Cat.4 | LTE Cat.4 | LTE Cat.4 |
| 1× SIM, 1× ETH, DI+DO | 2× SIM, 2× ETH, DI+DO, 1× RS232, 1× RS485 | 2× SIM, 4× ETH, DI+DO |
| **ICR-2031 - EMEA** | **ICR-2431 - EMEA, ICR-2441 - NAM** | **ICR-2531- EMEA** |
| **ICR-2041 - NAM** | **ICR-2432 - LATAM** | |
| | **ICR-2437 - EMEA, LTE 450** | **ICR-2600 series** |
| | **ICR-2436 - Private LTE** | LTE Cat.4 |
| | **LTE Cat. M1 & NB IoT** | 2× SIM, 4× ETH, 1× RS232, 1× RS485, DI+DO |
| | 2× SIM, 2× ETH, DI+DO, 1× RS232, 1× RS485 | **ICR-2631- EMEA** |
| | **ICR-2412 - EMEA, LTE 450** | |

### Platform v2i - Successors of v2

RAM - 128 MB, eMMC - 4096 MB
(838 MB for Router Apps, 512 MB for customer data)
ICR-OS, SW customization, Router App

| ICR-2700 Libratum | ICR-2800 series | ICR-2700 series |
|---|---|---|
| LTE Cat.4 | LTE Cat.4 | Wired |
| 2× SIM, 2× ETH, USB | 2× SIM, GNSS, 2× ETH, USB, 2× RS232/RS485 | 2× ETH, USB |
| **ICR-2734 Libratum - EMEA** | **ICR-2834 - EMEA** | **ICR-2701 - Global** |

### Platform lite

CPU 580 MHz

Flash RAM - 32 MB
RAM - 128 MB
Linux OS, No software customization

| ICR-1600 series |
|---|
| 2× SIM, 2× ETH, Optional WiFi, GPS |
| **ICR-1601 - EMEA** |

CERTIFICATIONS:

ANATEL · FIRSTNET Built with AT&T · AT&T · verizon

ISO9001 CERTIFIED · CE · RoHS 2002/95/EC · E8 · EHC · FC · KC · CCC · EN 50155 · c UL us LISTED
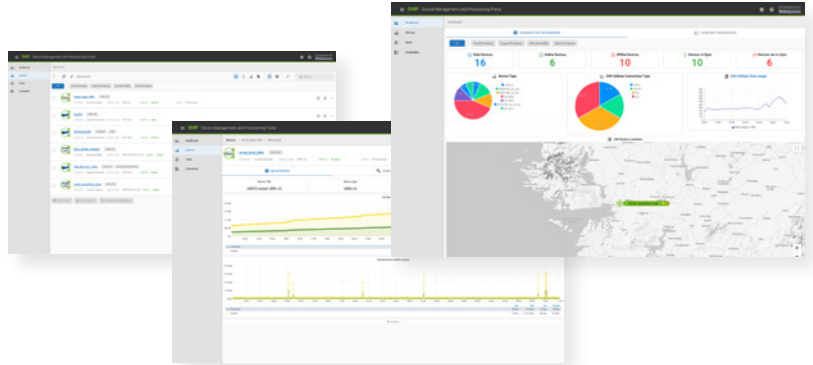
# WebAccess/DMP₂

*Remote device provisioning, monitoring and management platform.*



## Product Features

- Performance at Scale
- Extensible Architecture
- AssureAuth PKI
- Multi Tenancy
- AssureSync Configuration Management
- Secure Device Health Monitoring
- Built for Interoperability
- Fully API Enabled

**WebAccess/DMP** Generation 2 is an advanced Enterprise-Grade platform solution for provisioning, monitoring, managing and configuring Advantech's routers and IoT gateways. It provides a zero-touch enablement platform for each remote device.

With **WebAccess/DMP**, secure zero-touch pre-provisioning and pre-configuration is simple, regardless of how large your deployment is: from one device to thousands. The platform supports full multi-tenancy, with the possibility of permissions-enabled power-user oversight across tenancies.

### Performance at Scale

**WebAccess/DMP Generation 2** has been built for scale and performance. The backend service architecture includes high-availability broker clusters, with load-balancing and elastic scale enablement. Rest assured that your needs will be met, as you grow and scale your business.

### Extensible Architecture

**The platform** has been designed for **extensibility**. Using **leading-edge micro-services** enabled architectural best practices, together with **leading-edge elastic scale technologies**, load balancing and brokerage services, the platform will scale-out as necessary. The **user-interface** is built on our publicly **available API**, via our publicly available API Gateway, which enables real-time extensibility to available functionality, and the ability to integrate functionality with your existing services and infrastructure seamlessly: plug in, build-out.

### AssureAuth PKI

**Security** is **built-in** by design: we have built a full **Public Key Infrastructure** (PKI) stack into the product suite:  your connected devices are securely provisioned, certified and authenticated.

### Multi Tenancy

Every User must belong to at least one Tenant. Every User may belong to one or more Tenancies.  Every Tenant has an "Admin" User, who decides on how to grant user-permissions. For each User, for each Tenancy they belong to, unique user permissions may be granted.

### AssureSync Configuration Management

**WebAccess/DMP Generation 2** has incorporated **industry best-practice Digital Twin Device Model technology** and combined it with **real-time user-interface configuration** status indicators.  It is possible to granularly configure every possible configuration item on every device, as a Desired State. Every device will report its **actual configuration**, for every configuration item, which will be stored as a Reported State.  Our **AssureSync** Configuration Management engine will detect differences between Desired and Reported states, and automatically reconcile differences.

### Edge Intelligence App management

Deploy one or many of our pre-prepared **RouterApps** (also known as "**user modules**") directly from WebAccess/DMP, to one or many of your remote devices. Manage the Apps and versions you deploy: you can "pin" a specific Router App version, for each of your selected devices, as a Desired State, and you can manage the configuration settings for each Router App, for each device it's deployed onto.

Use the device's SDK to **build your own Edge Intelligence Apps**, then use the WebAccess/DMP API to publish and deploy your own Router Apps, at scale: WebAccess/DMP enables you to build your own required platform-side user-interface automatically.

Router Apps that you create yourself will be managed through our AssureSync configuration management engine, just like our native Router Apps.

### Secure Device Health Monitoring

Every remote **device has build-in secure health-monitoring status indicators**, that are reported to WebAccess/DMP, and stored in a **Time-Series database**: by default you get **2-months of history data**, which you can zoom-in on and analyse at will, in real-time.

Location Monitoring is also available, and can be enabled to show you precise GPS based geographic-location for each of your remote devices (devices equipped with a GNSS module).

### Built for Interoperability

**WebAccess/DMP Generation 2 is Fully API Enabled**: in fact, we built our entire user-interface application using the publicly-available secure REST based API, via our publicly available API gateway, which you can find at https://api.wadmp.com

This means that you have the power of interoperability with your existing infrastructure: integrate the available services that we provide with the services you wish to observe or consume.

### Alerts and Auditing

Keep your finger on the pulse - get an Alert when somebody tries to change a password on your device, it is going offline, or the cellular signal level is not enough. Trackback on what happened over your ICR asset with the Auditing feature, know who and when made changes.

# SMART DECISIONS BEGIN

## with Intelligent Management Software

# R-SEENET

## Monitoring & Management Software

**R-SeeNet** is the software system used for monitoring Advantech routers. It continuously collects information from individual routers in the network and records the data into a database.
Then it creates visual forms and reports for the network administrator.

R-SeeNet consists of two parts:

- **R-SeeNet Server**
  A server application that can be programmed to automatically send SNMP queries (Simple Network Management Protocol) to each router defined in the network. The application retrieves status information from the routers and records it in the database.

- **R-SeeNet PHP**
  A web-based application that accesses to the database and provides the user or network administrator with information about the status of individual routers as well as the status of the entire network.

## Available Data

Everything you need to know about your network's current status as well as a historical view of the information transferred today, yesterday, this week, this month and last month.

- Signal strength
- Data traffic
- Response time
- Router availability
- Number of mobile connections
- Number of channels connected
- Visual reports, tables and graphs
- Up to 2 months of past data for each router
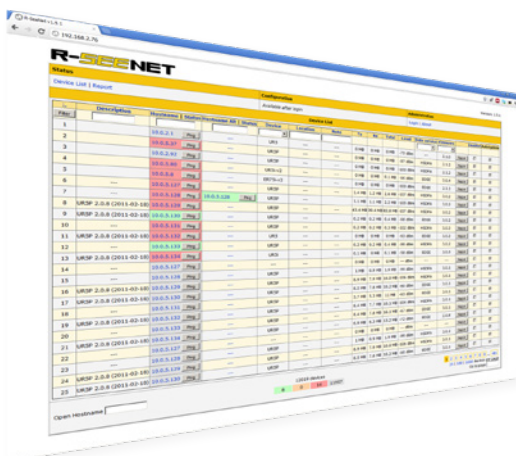


# WebAccess/VPN

## Advanced Secure Networking Platform

**WebAccess/VPN** is an advanced VPN management solution for safe interconnection of Advantech routers and LAN networks in public Internet. Connection among devices and networks can be regional or global and can combine different technology platforms and various wireless, LTE, fixed and satellite connectivities.

**WebAccess/VPN** provides an easy and secure connectivity platform for applications such as branch connection, remote access, machine monitoring in industry sectors like Utilities & Energy, Automation, Predictive maintenance, Industrial IoT for any end device types such as Computers, PLCs, RTUs, Cameras, Terminals…

**Product features:**

- Secure Private Networks in Internet
- Encrypted & Reliable Communication
- Centrally defined VPN topology
- Managed LAN, 1:1 NAT modes
- Firewall & Access Control
- User-friendly Management
- Easy Deployment
- Extensive Platform Compatibility

**WebAccess/VPN** makes it easy to set, scale and supervise secure networks of Advantech routers and other devices inInternet environment.

**WebAccess/VPN** solves network security issues and provides secure connections for individual LANs.

**All communication** going through the **VPN Portal** is encrypted and hidden from potential intruders.

The architecture of **WebAccess/VPN** withstands common attack vectors. The network traffic runs through OpenVPN tunnels.

**Independent** of mobile operators. No need for public or static IPs. No need for private APN or DDNS.

Each device connected to the router within **VPN network** has a fixed private IP address for transparent communication.

**User-friendly Management** helps admins and users to configure and control routers in their defined LANs.

**WebAccess/VPN** is compatible with SCADA systems, Linux, Windows, Smart phones, Tablets etc. & existing network topologies such as Cellular, Fibre, Satellite, ADSL.
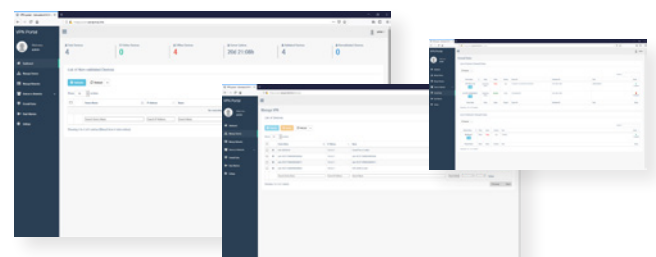
## TRANSPORTATION — SYDNEY FERRIES

**Region:** AUS
**Product:** ICR-3200
**Application:** Real-time monitoring of position Sydney Ferries

- Multicast support - PIM-SM
- GPS functionality - NMEA reporting
- Functionality IPtables
- VPN Functionality
- **R-SEENET** monitoring SW

## ENERGY — POWER DISTRIBUTION MANAGEMENT

**Region:** EMEA
**Product:** ICR-3200, SmartFlex, SmartMotion
**Application:** SCADA connectivity for power distribution company

- Scalable LTE routers in terms of interfaces with the same SW environment
- Centralized management tool **WebAccess/DMP₂**
- IEC101/104 protocol conversion provided by LTE router
- Compatibility with current SNMP monitoring system Zabbix
- Two IPsec VPN connections to two geographically separated firewalls due to redundancy
- Support SCEP (Simple Certificate Enrollment Protocol) as a key part of robust cyber security

## INDUSTRIAL EQUIPMENT MANUFACTURES — MONITORING OF ELEVATORS

**Region:** NAM
**Product:** ICR-3211B - 4G LTE Cat. M1, **WebAccess/VPN**
**Application:** Remote monitoring of lifts using LTE Cat. M1 cellulars routers

- Capability addresses the challenge of getting a reliable cell signal in basements and other in-building locations
- The built-in supercapacitor provides enough power for a "last gasp" message to be sent when the main power is lost
- The ICR-3211B supports the required software development tool Python3 Cloud Monitoring needed for integration with its own web-based applications

## E-MOBILITY — ELECTRIC CAR CHARGING STATIONS

**Region:** EMEA
**Product:** SmartFlex
**Application:** Cellular connection for car charging stations

- SD card holder on router device
- Galvanically isolated Ethernet and serial ports RS232/RS485
- Open platform to host third party software
- Wide temperature range
- Over voltage protection

## HEALTH CARE — MEDICAL DEVICE CONNECTIVITY

**Region:** NAM
**Product:** SmartFlex
**Application:** Surgical Machine, remote monitoring/control

- Multiple communication interface built-in
- Global cellular connectivity
- Use of global roaming SIM card
- Custom made **RouterApp**

## TRANSACTION MANAGEMENT — 3G/4G CONNECTION FOR LOTTERY TERMINALS

**Region:** EMEA
**Product:** ICR-2500, LR77 v2 Libratum
**Application:** On-line transactional networks for national lotteries

- Dual SIM failover capability
- Support of Multicast
- DMVPN / GRE tunnels support
- Automatic mass update of configuration and firmware update
- Management and monitoring **WebAccess/DMP₂**

## AUTOMATION — MONITORING OF BOILER SYSTEM

**Region:** ASIA
**Product:** SmartStart
**Application:** Monitoring of boiler system in hospitals, hotels and campuses enviroments

- Node-RED support
- Network edge data processing
- Dashboard Display for remote monitoring
- Alarm notification

## SECURITY — SECURING OF AIRSPACE

**Region:** NAM, EMEA
**Product:** SmartFlex
**Application:** Secures the World's Airspace with multi-edge computing

- PoE PSE powering of connected camera
- SmartFlex's on-board Wi-Fi provides a local connection for on-site technicians
- Serial interface RS232
- **WebAccess/VPN**

AMC

ADVANTECH iAutomation
Premier Partner

# Regional Service & Customization Centers

| China | Kunshan 86-512-5777-5666 | Taiwan | Taipei 886-2-2792-7818 | Netherlands | Eindhoven 31-40-267-7000 | Poland | Warsaw 00800-2426-8080 | USA | Milpitas, CA 1-408-519-3898 |

# Worldwide Offices

## Greater China

### China
| | |
|---|---|
| Toll Free | 800-810-0345 |
| Beijing | 86-10-6298-4346 |
| Shanghai | 86-21-3632-161 |
| Shenzhen | 86-755-8212-42 |
| Chengdu | 86-28-8545-019 |
| Hong Kong | 852-2720-5118 |

### Taiwan
| | |
|---|---|
| Toll Free | 0800-777-111 |
| Taipei & IoT Campus | 886-2-2792-781 |
| Taichung | 886-4-2372-505 |
| Kaohsiung | 886-7-392-3600 |

## Middle East and Africa
| | |
|---|---|
| Israel | 072-2410527 |

## Asia

### Japan

*(Vertrieb durch AMC – Analytik & Messtechnik GmbH Chemnitz, Heinrich-Lorenz-Str. 55, 09120 Chemnitz, Tel.: +49/371/38388-0, Fax: +49/371/38388-99, E-Mail: info@amc-systeme.de, Web: www.amc-systeme.de)*

### Thailand
| | |
|---|---|
| Bangkok | 66-02-2488306-9 |

### Vietnam
| | |
|---|---|
| Hanoi | 84-24-3399-1155 |

### Indonesia
| | |
|---|---|
| Jakarta | 62-21-751-1939 |

### Australia
| | |
|---|---|
| Toll Free | 1300-308-531 |
| Melbourne | 61-3-9797-0100 |

### India
| | |
|---|---|
| Bangalore | 91-80-2545-0206 |
| Pune | 91-94-2260-2349 |

## Europe

### Netherlands

| Newcastle | 44-0-191-262-4844 |
|---|---|
| London | 44-0-870-493-1433 |

### Spain
| | |
|---|---|
| Madrid | 34-91-668-86-76 |

### Sweden
| | |
|---|---|
| Stockholm | 46-722-293423 |

### Poland
| | |
|---|---|
| Warsaw | 48-22-31-51-100 |

### Russia
| | |
|---|---|
| Moscow | 8-800-555-01-50 |
| St. Petersburg | 8-800-555-81-20 |

### Czech Republic
| | |
|---|---|
| Ústí nad Orlicí | 420-465-52-44-21 |

### Ireland
| | |
|---|---|
| Galway | 353-91-792444 |

## Americas

### North America
| | |
|---|---|
| Toll Free | 1-888-576-9668 |
| Cincinnati | 1-513-742-8895 |
| Milpitas | 1-408-519-3898 |
| Irvine | 1-949-420-2500 |
| Ottawa | 1-815-434-8731 |

### Brazil
| | |
|---|---|
| Toll Free | 0800-770-5355 |
| São Paulo | 55-11-5592-5367 |

### Mexico
| | |
|---|---|
| Toll Free | 1-800-467-2415 |
| Mexico City | 52-55-6275-2727 |

**RouterApp  ICR-OS  WebAccess/VPN  WebAccess/DMP$_2$**

**Cumulocity** Connect to Innovate  **deviceWISE** by Telit  **Azure**  **Node-RED**

**ADVANTECH**
*Enabling an Intelligent Planet*

**AMC**  **ADVANTECH iAutomation Premier Partner**