

iCex: The Edge Controller That Eliminates IoT Complexity

Stop managing gateways, loggers, and firewalls. Start controlling your critical infrastructure from a single, secure, Cloud-Native platform.

The digital transformation in the industrial & utilities sector demands a complete paradigm shift from traditional SCADA. The RealiteQ iCex is not just a Gateway; it is the **Edge-to-Cloud nucleus** that simplifies deployment, hardens security, and ensures the data integrity necessary for AI, Digital Twins, and true operational efficiency.

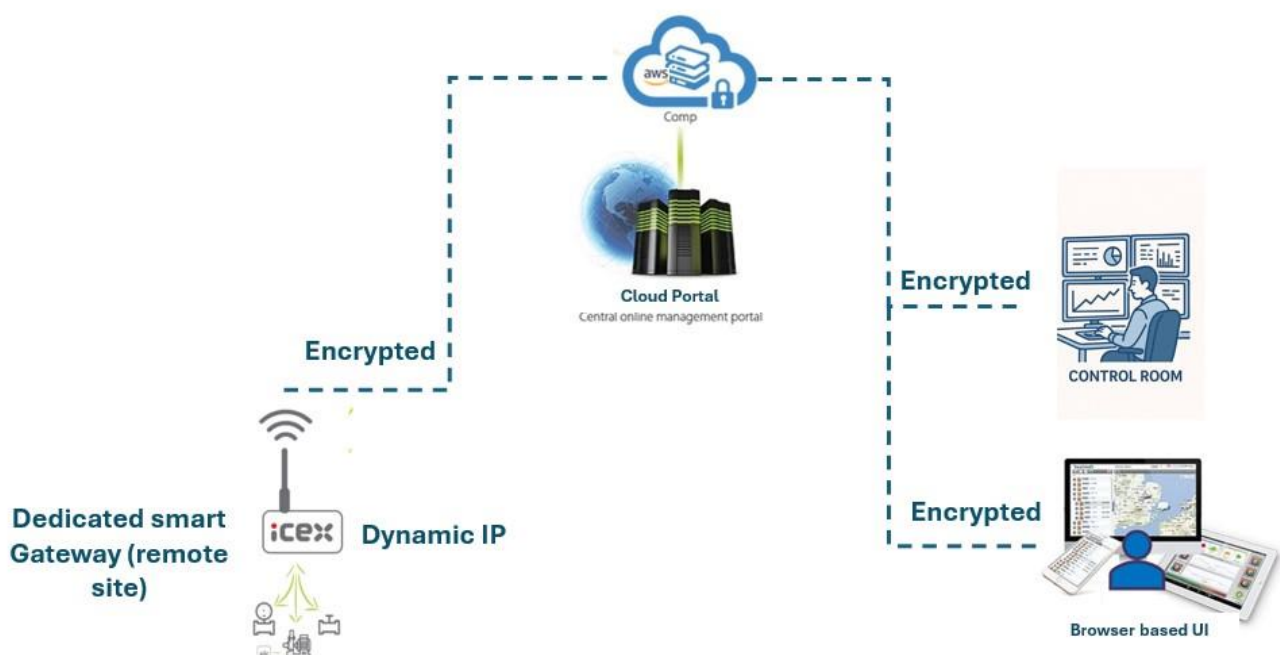
The iCex is a smart Gateway with unique and dedicated RealiteQ software embedded in it. It's part of the RealiteQ 4.0 SCADA system. This makes the iCex an integral part of RealiteQ. It's difficult to divide "pure" iCex functionality from general functions of the whole RealiteQ cloud Platform (iCex, COMP, RealiteQ UI), and that makes all the differences from "on the shelf" gateways.

The iCex is designed to provide enhanced functionality and seamless integration with the RealiteQ cloud platform, making it a robust solution for industrial IoT applications.

The iCex is easy and simple to use with minimal manual configuration. Once set and connected, it automatically establishes communication with RealiteQ software in the cloud (Central Online Management Portal - COMP).

Pre-configured Settings reduce the need for extensive setup and make the field installation of the iCex practically almost "Plug & Play".

Installing gateways in the field can present several challenges. Those are some of the challenges that the iCex is designed to solve. The iCex includes the capabilities of the most advanced standard gateways and add another layer of capabilities which make the installation simple, fast and provides reliable, secured and almost maintenance free solution, compared to the standard gateways.



Compatibility and Integration

Ensuring the gateway is compatible with various devices and communication protocols can be complex. This often requires additional hardware, extensive configuration and testing.

Practically any industrial device can be connected to RealiteQ. iCex supports Ethernet, RS232 and RS485. All 3 ports can be used simultaneously.

iCex supports also the most popular industrial communication protocols.

iCex can communicate via 3 different protocols simultaneously.

The iCex has Built in analog input and 3 digital I/O. Each digital I/O can be set separately as input or as output. Settings are done only via software – no jumpers or dip switches. If set as output, digital I/O can be operated via RealiteQ platform.

The iCex has built in 3 counters – one per DI. Each one of them counts pulses with different options to reset and keeps previous value after reset. Each one of the counters measures also the frequency of the incoming pulses.

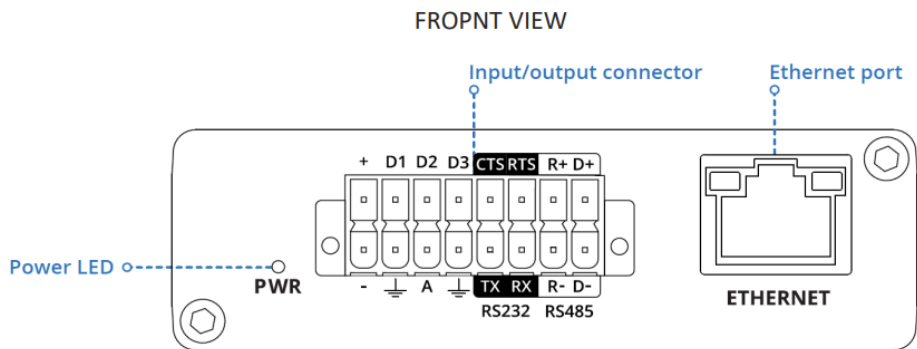
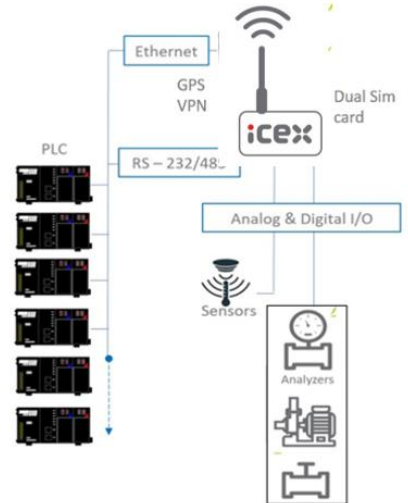
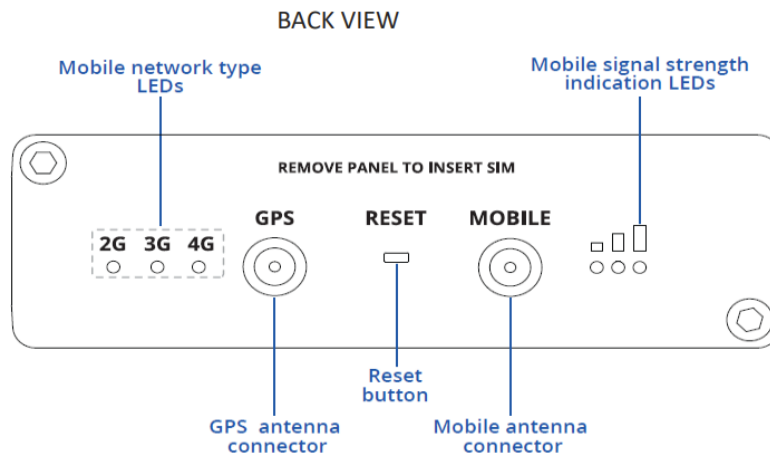


Fig. 1 iCex Front view



Moving Beyond the Legacy Gateway Trap

Connectivity: Ensuring reliable connectivity between the gateway and the network can be difficult.

The iCex is connected directly to RealiteQ COMP. Communication with RealiteQ software is done via proprietary, highly secured protocol MCP on top of HTTPs.

The establishment of the connectivity to COMP is very easy, practically, almost “plug & play”. It can be connected both via LAN and cellular networks. Supports connection via satellite too (via satellite modem). It supports redundancy between cellular and LAN connection. When connected via LAN, access to internet and COMP is via standard port 443. No need for changes in LAN settings.

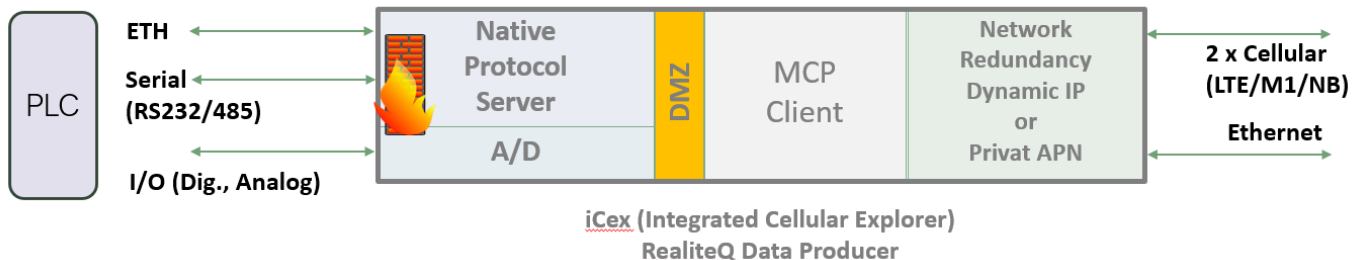
Connecting via cellular: the iCex Supports 2 SIM cards with multiple advanced conditions to switch between them.

In cellular network iCex acts not as a “server”, like other gateways, but as “client”. Ordinary SIM cards can be inserted – no need for SIM with static IP. Dynamic IP increases security.

Functionality – The iCex keeps a log of selected parameters in case of communication failure. When communication to COMP returns, sends automatically logged data to it.

Security Concerns: Protecting the gateway from cyber threats is crucial and an important issue to deal with.

The iCex has many built-in Cybersecurity capabilities which together with the COMP tools and procedures make RealiteQ a highly secure system



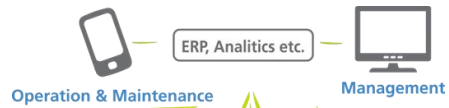
iCex provides DMZ functionality – data is fully divided between taken from the field and exchanged with COMP.

128-bit Access token is generated by the software and is used for recognizing iCex by the server. Other tools and procedures, such as configurable firewall, SSL/SSH encrypted communication, Dynamic IP address, and more are increasing cyber security too.

Role of iCex Units

1. Data Acquisition

- **Real-Time Data Collection:** iCex units are responsible for collecting real-time data from various sensors and devices in the field. This data can include parameters like temperature, pressure, flow rates, and more.
- **Protocol Support:** They support multiple communication protocols allowing them to interface with a wide range of industrial equipment.



2. Data Transmission

- **Secure Communication:** iCex units securely transmit the data to the RealiteQ state server (COMP) using encrypted communication channels (SSL/TLS).
- **Remote Locations:** They are designed to operate in harsh environments, ensuring reliable data transmission in challenging conditions.

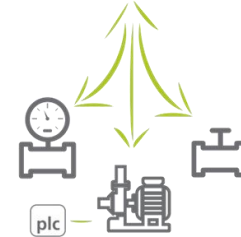


collected

remote and even in

3. Control and Automation

- **Remote Control:** iCex units enable remote control of devices. Operators can send commands 24/7 from the control room or its device (laptop, tablet, smartphone...) settings or perform actions on-site.



field central to adjust

4. Edge Computing

- **Local Processing:** iCex units can perform smart filtering, reducing the amount of data that needs to be transmitted to the central server. This helps in optimizing bandwidth usage and improving response times.

5. Redundancy and Reliability

- **Failover Mechanisms:** iCex units are equipped with failover mechanisms to ensure continuous operation. In case of a communication failure, they can store data locally and transmit it once the connection is restored.
- **Robust Design:** Built to withstand industrial environments, they offer high reliability and durability.

The RealiteQ iCex units provide a comprehensive solution for remote monitoring and control, offering enhanced security, flexibility, and operational efficiency compared to other gateways. Its ability to support multiple communication protocols, to perform local processing and to ensure reliable data transmission makes them an ideal choice for industrial applications.

RealiteQ ICEX Specifications

| Model Parameter | ICX-T246LTE-CAT4-xx |
|-----------------------------------|---|
| Mobile module | 4G (LTE) – Cat 4 - Up to 150 Mbps 3G – Up to 42 Mbps 2G – Up to 236.8 kbps |
| SIM card | 2 SIM slots; (Mini SIM – 2FF), 1.8V/3V, Double stacked SIM tray, Auto switch, Auto APN |
| LAN | 1 x LAN port 10/100 Mbps, comply IEEE 802.3, IEEE 802.3u, IEEE802.3az |
| RealiteQ Data Producer | MCP, HTTPs, Event Channel |
| Network Protocols | TCP, UDP, IPv4, IPv6, ICMP, NTP, DNS, HTTP, HTTPS, FTP, SMTP, SSL v3, TLS, ARP, PPP, SSH, DHCP, Telnet, MQTT, Wake On Lan (WOL), VXLAN |
| Firewall | Configurable |
| VPN | RealINAT – secure VPN based tunnel to remote connection to iCex and connected to it devices (PLC and smart instruments) |
| Serial ports | 1 x RS232: Terminal block connector: TX, RX, RTS, CTS 1 x RS485: Terminal block connector: D+, D-, R+, R- (2 or 4 wire interface) Both ports can be used simultaneously |
| Baud rates | 9600 – 38400 |
| Data bits | 8 |
| Stop bits | 1 |
| Parity | None, Even, Odd |
| Communication protocols supported | Modbus RTU, Modbus TCP, Siemens TCP, Ethernet/IP (for selected AB models) SNPX, OPC UA, MQTT Other protocols may be implemented upon request. Supports 3 different protocols simultaneously |
| Location tracking | GPS, GLONASS, BeiDou, Galileo and QZSS, Geofencing, position accuracy 2.5 m |
| Digital I/O | 3 x configurable: Inputs: 0-6V = logic low; 8-30V = logic high Outputs: Open collector; max 300 mA@30Vdc |
| Counter inputs | All digital inputs may be configured as counter inputs |
| Analog input | 1 x analog input (0–30V) |
| Status LEDs | 2G/3G/4G indication, Power, ETH status, 3 x signal strength |
| CPU | Mediatek, 580 MHz, MIPS 24KEc |
| RAM | 128 MB |
| Flash storage | 16MB |
| Operating system | RealiOS based on LINUX |
| Power supply: | 9–30 VDC, reverse polarity protection, surge protection +/-1 kV 50 µs max |
| Power consumption | Idle: < 1.5 W, Max: < 3.5 W |
| Operating Temp. | -40 C to 75 C (including built-in device temperature sensor) |
| Storage temperature | -40 to 75 C |
| Operating humidity | 10% to 90% non-condensing |
| Ingress protection rating | IP30 |
| Casing material | Aluminum housing |
| Dimensions | 83 x 25 x 74.2 mm (W x H x D) |
| Installation | 35 mm DIN rail |
| Weight | 165 g |
| Approvals | CE, UKCA, EAC, RCM, FCC, IC, CB, WEEE |