

# Icomera X7

## Scalable, Future-Proof Connectivity for Rail



### High-Performance Mobile Connectivity Router, Virtual Application Hosting, and Integrated Storage

- Industry-leading Internet connectivity using 5G/4G/Wi-Fi/Trackside/Satellite
- Supports 3GPP Release 16 and Wi-Fi 6
- Intel® Xeon processor
- Up to 22 Nano SIMs
- Storage:
  - Up to 2TB SSD for applications
  - Up to 16TB externally accessible SSD for video recordings

The X7 is Icomera's flagship high-performance mobile connectivity and applications hosting platform, purpose-built for public transport. It unifies future-proof aggregated connectivity, secure virtualised application hosting, and robust built-in storage to satisfy even the most demanding requirements.

Operators can choose from several models optimised to meet their business requirements, opting to install a single X7 per train or vehicle consist, or pairing two units together to provide data load balancing and redundancy.

### Supercharged Aggregated Connectivity

Icomera's X7 unit houses up to five 5G radio modems (supporting 3GPP Release 16) and 22 Nano SIMs, integrates Wi-Fi 6 technology, and features 2 x 10 Gbps and 1 x 2.5 Gbps Ethernet ports, delivering unparalleled data throughput and low latency for a range of transport applications.

The X7 utilises SureWAN™, Icomera's industry-leading connectivity technology protocol for combining multiple networks (cellular, satellite, trackside) in parallel, providing the fastest, most reliable connection available for onboard systems, as well as high volumes of passengers who can connect directly to the X7's inbuilt dual-band Wi-Fi access points.

### Out-of-the-Box Virtualised Application Hosting

Operators reduce the total number of onboard devices by running multiple, resource-intensive applications simultaneously from a single X7 unit: Passenger Wi-Fi, Infotainment, Real-Time Digital Video Surveillance, AI-Enhanced Video Analytics, and more.



The X7 supports fully scalable, secure virtualisation technologies, leveraging Kubernetes containerised workloads to deliver software-defined services, which are all monitored using Icomera's state-of-the-art management tools.

Configurations with Intel® Xeon® processors (4-core 2.4/4.4 GHz or 8-core 2.6/4.2 GHz, both with Hyper-Threading) and 8 - 32GB RAM provide ample headroom for concurrent workloads, while over-the-air updates streamline lifecycle management.

### Integrated Storage

The X7's built-in storage options support resource-intensive applications and media using a 256GB system drive, complemented by 512GB, 1TB, or 2TB SSDs. For video and bulk data, models can be configured with up to two externally-accessible SSDs, offering up to 16TB total capacity.

The substantial storage capacity of the X7 supports month-scale video surveillance data retention, content caching, and efficient physical data transfer, eliminating the need for costly additional NAS storage devices.

### Reliable, Ruggedised & Secure

With its IP65 aluminium chassis and -40°C to +70°C operating temperature, the X7 is specially built for transport applications, delivering long-term reliability and high security through Secure Boot, encryption of sensitive data, a built-in firewall, WPA3 encryption, and the ability to deploy over-the-air security patches.

Please contact [sales@icomera.com](mailto:sales@icomera.com) to find out more

## CPU

Configurations available with either:

- Intel® Xeon® 2.4 / 4.4 GHz Processor, 4-core with hyper-threading - or
- Intel® Xeon® 2.6 / 4.2 GHz Processor, 8-core with hyper-threading

## RAM

8 to 32GB

## Storage

- 256GB for OS
- 512GB, 1TB or 2TB for applications
- 4, 8, 16, or 32TB SSD behind a cover for storage of video recordings

## WWAN Radio

Up to 5 5G modems

- 5G: sub-6 FDD and TDD, SA and NSA operations, 3GPP Release 16
- 4G: CAT. 20 (2Gbps) on DL, CAT. 18 (211Mbps) on UL, 3GPP Release 16
- 5G 4 x 4 MIMO support on Bands: n1, n2, n3, n7, n25, n30, n38, n40, n41, n48, n66, n75, n77, n78, n79
- LTE 4 x 4 MIMO support on Bands: B1, B2, B3, B4, B7, B25, B30, B32, B34, B38, B39, B40, B41, B42, B43, B48, B66
- 5G bands: n1, n2, n3, n5, n7, n8, n20, n25, n28, n29, n30, n38, n40, n41, n48, n66, n71, n75, n77, n78, n79
- LTE bands: B1, B2, B3, B4, B5, B7, B8, B12, B13, B14, B17, B18, B19, B20, B25, B26, B28, B29, B30, B32, B34, B38, B39, B40, B41, B42, B43, B46, B48, B66, B71
- Up to 22 Nano SIM (4FF) cards

## Wi-Fi

Up to 2 dual band Wi-Fi cards

- 2.4GHz, supporting 802.11b/g/n/ax
- 5GHz, supporting 802.11a/n/ac/ax
- 2.4GHz, 4x4 MU-MIMO, up to 1376.4Mbps physical data rate
- 5GHz, 4x4 MU-MIMO, up to 4804Mbps physical data rate

Encryptions: WPA-PSK, WPA2-PSK, WPA-EAP, WPA3-SAE, WPA3-SAE mixed mode, WPA3-enterprise, Wi-Fi Enhanced Open.

Each radio can operate as either an Access Point or as a client.

## Wireless Interfaces

Supports 5 cellular modems and 2 Wi-Fi cards (max 6 modules simultaneously)

## GNSS Info

- 92-channels

## GNSS constellations:

- GPS L1
- QZSS L1 C/A
- GLONASS L10F
- Galileo E1B/C

- BeiDou B1
- Positional Accuracy (CEP): 1.5 m
- Acquisition (@ -130dBm)
  - Hot start: 2 s
  - Cold start: 24 s

## Dimensions

359 x 286 x 121 (W x D x H mm)

## Weight

7.5 kg

## Chassis Material

Aluminium

## Ingress Protection

IP65

## Environmental (Operating & Storage

### Temperature Info)

- Operating temp: -40 to +70° (85°C for 10 minutes), EN50155 OT4 ST1
- Humidity operating: 10 to 90% r.H. non cond.
- Storage temp: -40 to +85°C
- Humidity Storage: 5 to 95% r.H. non cond.

## Power Inputs

- 24 to 110 VDC, compliant to EN50155
- M12 K-coded Power connector

## Power Interruption

EN 50155, Class S2 (10ms interruptions), when operating at 110VDC nominal. Class S1 (no interruptions) when operating at lower nominal voltages.

## Power Consumption

- < 250 W (maximum configuration)
- < 200 W (8-core CPU, 4 WWAN, 1 Wi-Fi, no externally accessible SSDs)

## Antenna Connectors

- 28 QMA for cellular and Wi-Fi
- 1 QN for GNSS

## Ethernet

- 2x M12 X-coded 10Gbps Ethernet (also supporting 5G/2.5G/1G/100M/10M bps)
- 1x M12 X-Coded 2.5Gbps Ethernet (also supporting 1G/100M/10M bps)

## LEDs

- LEDs indicating status of Power, Cellular links 1-5, LAN 1-3 and System Connectivity

## Compliance

- CE Conformity
  - RED (2014/53/EU)
  - Article 3.1 (a): Health and Safety of the User:
    - EN 50385
    - EN 62311
    - EN 62368-1
    - IEC 62368-1
  - Article 3.1 (b): Electromagnetic

## Compatibility:

- EN 301 489-1
- EN 301 489-17
- EN 301 489-19
- EN 301 489-52
- Article 3.2 : Effective and efficient use of RF spectrum:
  - EN 300 328
  - EN 300 440
  - EN 301 893
  - EN 301 908-1
  - EN 301 908-2
  - EN 301 908-13
  - Draft EN 301 908-25
  - EN 303 413
- RoHS (2011/65/EU & 2015/863)
- UK Radio Equipment Regulations 2017, (RER)
- Rail Industry Requirements
  - EN 45545 Fire Assessment
  - EN 50155 Rolling Stock (EMC, Environmental)
  - EN 50125 Environmental
  - EN 50153 Electrical Safety
- USA and Canada market:
  - FCC:
    - 47 CFR FCC Part 15b, 2.1091, 15.31(h)
    - CP65
  - ISED:
    - ICES-003 Issue 7
    - RSS-102 Issue 5
- Additional compliance:
  - IP65 rating to EN 60529
  - Conflict Minerals

## Network Services

- Icomera patented seamless WAN switching and aggregation.
  - DHCP, DNS, SNTP/NTP, SNMP version 3 service, etc
- Supported Protocols
- IP (TCP/UDP), IPv4, IPv6, VLAN (802.1q), ICMP, QoS (802.1p) etc

## Application Support

Supports virtualisation technologies to allow applications to run in virtual environments. The number of virtual machines that can run on the system is subject to resource availability on the host machine.

## Cloud-Based Management Tools

Post-installation, Icomera's technology empowers you to manage your solution independently. Designed specifically for public transport applications, Icomera's Network Insights and Control (ICONIC) cloud-based software tools allow remote monitoring and updating of systems, without any disruption, which just isn't possible using standard office network IT systems.