

iCell TRINITY- Solving Indoor Connectivity Challenges

Enterprises in healthcare, manufacturing, logistics, and smart buildings face a common challenge: ensuring reliable, real-time connectivity for critical applications like video, voice, and asset tracking.

Traditional solutions fall short:

- Wi-Fi struggles with coverage and reliability in large or complex indoor environments.
- Public mobile networks (4G/5G) are optimized for outdoor coverage and cannot guarantee consistent performance indoors.
- Separate IoT networks (e.g., LoRaWAN gateways) require additional infrastructure, increasing complexity and cost.

The Gap:

While private 5G networks promise high-performance, low-latency connectivity, there is a lack of commercially available 5G IoT devices to fully leverage this technology for asset tracking, sensor monitoring, and other low-power IoT applications.

At the same time, existing LoRaWAN deployments solve these IoT use cases well, but require separate hardware and management.

This leaves enterprises with a fragmented approach:

- A private 5G network for real-time broadband applications.
- Separate networks for low-power IoT devices.
- Duplicated infrastructure, higher costs, and increased complexity.

Built for the Future:

At the heart of the iCell TRINITY is **powerful Software Defined Radio (SDR) hardware**. This means:

- Installed radios can be **upgraded via software**, adding new capabilities and supporting additional standards as they become available.
- Enterprises avoid costly hardware replacements when adopting future technologies.
- The system evolves with your needs, providing a **future-proof connectivity platform**.

Business Impact:

This unified approach simplifies infrastructure, reduces operational costs, and prepares businesses for future 5G IoT devices — all while solving immediate connectivity needs. For decision makers, the iCell TRINITY means fewer network headaches, lower total cost of ownership, and a clear path to operational efficiency.



Technical Infrastructure Overview

The iCell TRINITY operates as an **indoor edge connectivity node**, bringing together private 5G and LoRaWAN networks within a unified platform. Its architecture bridges the gap between real-time communication needs and cost-effective IoT deployments, while simplifying network management.

At its core, the iCell TRINITY integrates:

- A **5G gNodeB** handling radio, user plane, and control plane functions (RU, DU, CU) in a single unit.
- An **SX1303-based LoRaWAN gateway** managing connections to battery-powered IoT devices.
- An **Edge Compute platform** that supports local data processing and application hosting.
- Backhaul interfaces connecting to the **Private 5G Core Network** and **LoRaWAN Network Server (LNS)**.

The device connects upstream via:

- An **N2 interface** linking the gNodeB to an external or virtualized **5G Core (5GC)**, typically hosted in the enterprise data center or cloud.
- A standard **IP connection** to the **LoRaWAN Back Office (Network Server)**, which can also be on-premises or cloud-hosted.

All user and IoT data is processed securely, with traffic segmented through network slicing where needed. Local breakout for critical applications ensures minimal latency for on-site operations.

This setup allows enterprise IT teams to manage both networks through a **single pane of glass**, reducing complexity and operational overhead.

