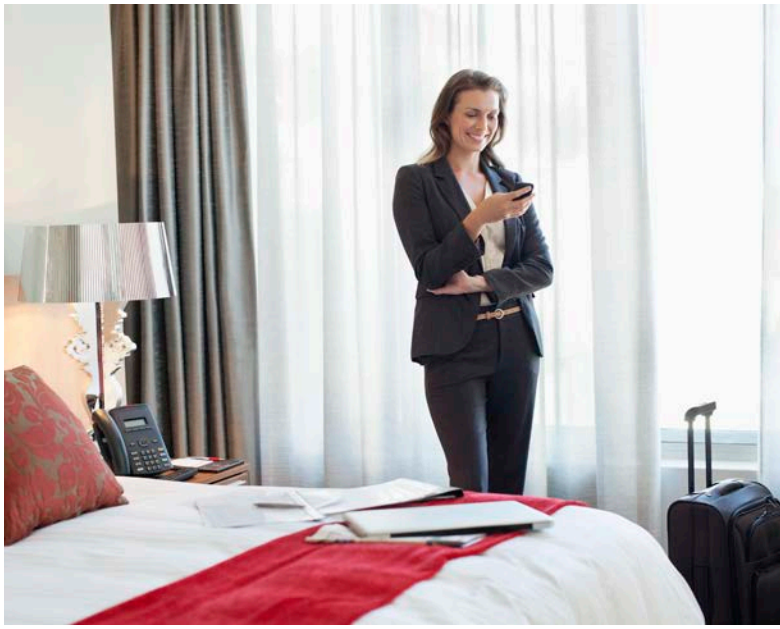
KATHREIN

# K-BOW
# Integrating WiFi and In-Building Mobile Cellular Services in a Common Infrastructure

## K-BOW Overview

With K-BOW, Kathrein provides a flexible wireless data infrastructure for in-building requirements. Based on the latest fibre distribution technology, K-BOW can deliver mobile cellular services from a centralised base station pool to different buildings and/or coverage areas. The K-BOW solution can best be described as a Micro C-RAN solution, but it also contains a transparent Ethernet channel which can be used for standard IT applications and services. The flexibility to control mobile cellular capacity needs, based on a low power Remote Unit infrastructure, secures a future proof installation. K-BOW is also renowned for the attractive and highly acclaimed design of the Remote Units, which can be aesthetically integrated in a modern interior design.



## Motivation

Operators serving shopping malls, enterprises, venues and public buildings are challenged to provide a good data infrastructure. Pervasive WiFi and cellular coverage are key to a good customer or employee experience.

## Mobile Cellular Network Stands for Secure and Reliable Connection

Mobile cellular networks are able to provide seamless mobility and strong quality of service based on a high-speed data network such as LTE-A. Due to WiFi challenges with respect to security and authentication with Internet end-to-end connections, there is a substantial demand to have a dedicated data connection over carrier cellular networks for confidential emails and business data. Today, a phone call or message over WiFi is the most inexpensive way to make international calls. Such IP calls, or WiFi Calling solutions, are becoming increasingly popular. However, one of the most important requirements that subscribers have is to always be reachable via phone or messaging services. This has to be ensured. Today, and for the foreseeable future, this can only be ensured by cellular mobile coverage. In hot spot areas, where many people are in one place (e.g. conference or ballrooms), WiFi has its challenges with interference of the multiple WiFi devices. This often leads to a breakdown of the wireless network or to very slow connections. Due to frequency coordination in mobile networks, the cellular network is a good backup for these situations.

Mobile networks are becoming more important than WiFi hot spots for indoor wireless strategies, as the need for seamless mobility and consistent indoor voice coverage remains paramount.

## Emerging Technologies Need Both: Cellular and WiFi

There are numerous pros and cons for WiFi or in-building cellular networks. Technology options are now emerging which require integration of both technologies. LTE-U and WiFi Calling are two examples of upcoming services which converge these two technologies. No single predefined technological solution can provide all the answers. Therefore, the selection and design of the right solution must be based on the specific requirements for any given use case. In order to meet the challenges of broadband speeds, quality of service, security, coverage and consistency of end user experience, a platform and strategy for both technologies is required.

With a combined and harmonised mobile cellular and WiFi infrastructure, the flexibility for upcoming emerging technologies is ensured. This protects your investment in the future.

## Solution Description

By providing an integrated transparent Ethernet channel between the Expansion Hub and the Connect RU, K-BOW is able to transport up to 700 Mbps on its fibre cabling infrastructure. Powered by PoE on the Ethernet port of the Connect RU, an additional WiFi access port can be installed next to the Remote Unit.

### K-BOW WiFi Integration

**Optimisation Layer**

Connect RU with WiFi access point by PoE

1) WiFi AP
2) Passive antenna

**Distribution Layer**

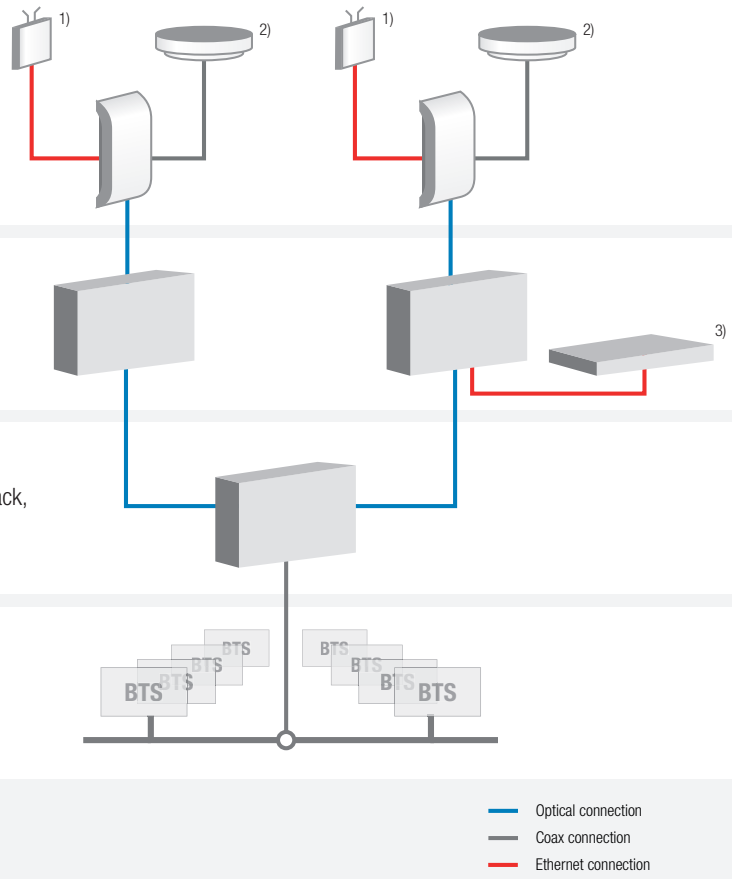
AP controller connected over IP-switch to E-Hub

3) IP-switch

**Aggregation Layer**

Up to 42 analogue BTS sectors per C-Hub subrack, multiple subracks possible

**Base Station Pool (BTS)**



There are three different ways to connect the access point control unit, and subsequently the WiFi authentication server, to the K-BOW infrastructure.

1. **Access point control unit connected directly to the K-BOW Expansion Hub:** This solution is best deployed when each E-Hub area (building or individual coverage area) needs its own WiFi infrastructure. For example, a big enterprise building housing more than one company with the demand to have dedicated isolated WiFi installations should use this architecture.

2. **Access point control unit connected directly to the K-BOW Central Hub:** This solution is suitable for big campus areas, hotels and venues where only one WiFi installation for the complete K-BOW infrastructure is needed.

3. **Access point controller and authentication in the cloud:** Suitable for solutions which have a dedicated DSL connection or public IP connection to a centralised authentication and control server. This solution is generally preferred and needed for virtual WiFi services, carrier grade WiFi or location independent WiFi networks.

## Targeted Industries

- Airports
- University campuses
- Enterprise and office buildings
- Hotels and conference centres
- Shopping malls
- Public sector
- Public venues

## Served Regions

- Europe
- Middle East
- Africa
- APAC

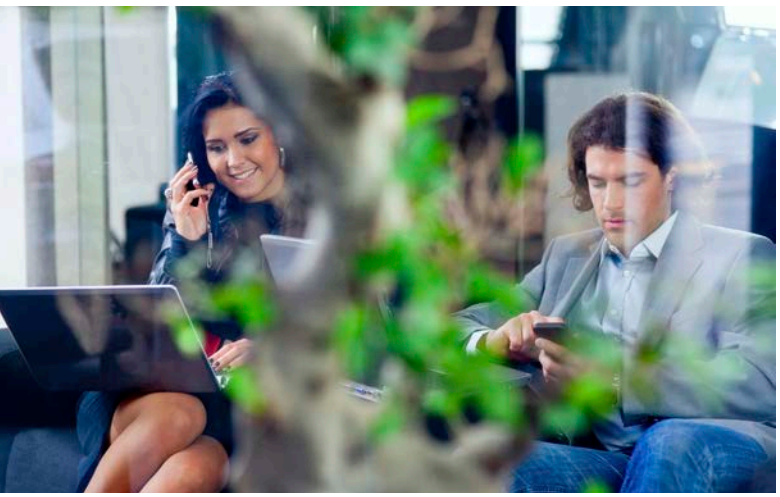
Connect RU

## Customer Benefits

Generally speaking, the customer has all the benefits of the available K-BOW features, together with the service offerings of a mobile cellular network and a WiFi system with one infrastructure.

**Mobile cellular network for a pervasive reliable coverage and data capacity**

- Multi technology (GSM, UMTS, LTE) coverage with one Remote Unit
- Support of full MIMO capabilities
- Secure connections over mobile network to avoid “man-in-the-middle” incidents
- Reachability for voice calls
- Multi-operator system on one fibre infrastructure and Remote Unit
- Independently managed cellular infrastructure per operator



**WiFi network for data offloading and streaming**

- Use of the existing K-BOW fibre infrastructure installed where needed for best radio infrastructure
- Secure and dedicated WiFi network

**Reduced deployment costs and inconvenience**

- Kathrein validated the coexistence of K-BOW Remote Units and Ethernet/IP applications so that they do not impact each other’s performance
- Reduces installation costs by using one fibre infrastructure for multiple uses
- Reduces installation time by half compared to conventional cellular antenna solutions and dedicated WiFi installations
- End-to-end network configuration and monitoring using a SNMP based network element manager
- Eliminates extra cabling for power by using hybrid fibre/copper cabling and PoE
- Aesthetically appealing WiFi access points have similar appearance to the K-BOW Remote Unit

**Secures the Investment**

- Flexible remote sectorisation for growing or changing cellular capacity demand
- Ability to extend K-BOW infrastructure with additional IP services like surveillance cameras, smart room automation, etc.
- WiFi areas can be easily changed without re-cabling
- Change of mobile network operator without reinstalling the K-BOW system

## Kathrein is a leading international specialist for reliable, high-quality communication technologies.

We are an innovation and technology leader in today's connected world. Our ability to provide solutions and systems enables people all over the world to communicate, access information and use media, whether at home, at the office or on the road.

We cover a broad spectrum: from outdoor and indoor mobile communication solutions, to satellite reception, broadband and broadcast technology, to transmission and reception systems in vehicles.

As a hidden champion and family-owned enterprise, we have been working on the technologies of tomorrow since 1919. We take pride in our dedicated employees and our passion for customers and quality.

**More Information:**
KATHREIN-Werke KG
Anton-Kathrein-Straße 1-3
83022 Rosenheim, Germany
Phone +49 8031 184-0
www.kathrein.com | k-bow@kathrein.de