

SPINNER

Passive In-Building Wireless Solutions



Maximize Coverage –
Minimize Costs



HIGH FREQUENCY PERFORMANCE WORLDWIDE
www.spinner-group.com



SPINNER Sets Standards in RF Technology

For more than 75 years, the SPINNER Group has been setting new standards worldwide in high-frequency technology. Based in Munich with production facilities in Germany, Hungary and China, SPINNER currently has over 900 employees. Our international network of subsidiaries and distributors supports customers in over 40 countries.



SPINNER Solutions for Mobile Communications

SPINNER, which enjoys the confidence of leading providers and network operators, supplies a full range of the passive RF components that are needed to link base stations and antennas for all popular types of communication networks used worldwide. Our innovative products and solutions for using indoor and outdoor antenna systems for multiple purposes enable cost-effective installation and use of wireless communication networks, also in challenging conditions.

In-Building Mobile Coverage

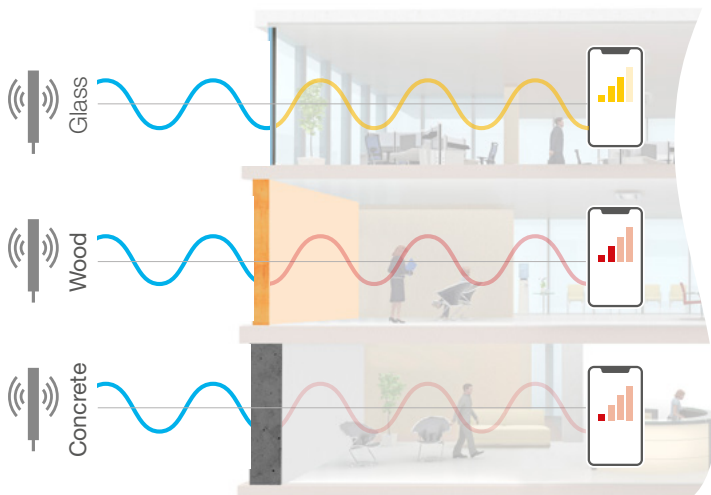
The Current Situation:

The ability to receive mobile signals has become an integral part of our everyday lives and something that we take for granted. Everyone now expects to be able to communicate everywhere and at all times. It's also a fact that more than 90% of the data traffic carried by mobile communication networks is sent and received inside buildings.

The Challenge:

Reception drops off dramatically behind concrete and glass exteriors, and signals often fail to penetrate very far into large buildings. The situation is bound to worsen with the advent of 5G, since this system uses the highest frequency bands – which, unfortunately, suffer from even greater signal attenuation (see the table at the bottom right).

Signal Attenuation in Buildings



Material	Thickness	Attenuation
Glass	13 mm	38 %
Timber	76 mm	50 %
Brick	180 mm	70 %
Engineered Wood	160 mm	80 %
Concrete	102 mm	80 %
Concrete	203 mm	99 %

Measured values at 900 MHz, source: FSM

Sustainable, Cost-Effective, and Future-Safe: Passive In-Building Solutions from SPINNER



Our passive In-Building solutions deliver excellent coverage both inside buildings and across large areas such as campuses. Especially when buildings contain many concrete and glass surfaces, an in-building solution is indispensable for ensuring satisfactory use of smartphones.

Experience has shown that active In-Building solutions typically cost twice as much as equivalent passive ones. Passive solutions deliver savings because, in contrast to active systems, they require no power supply and no maintenance. This eliminates all of the costs that would otherwise be incurred for operating, monitoring, maintaining, updating, and servicing the system.

Our In-Building systems are also easy to expand when and as needed, thanks to their modular design. You can flexibly integrate additional operators and new sectors. Our splitters and tappers cover frequency ranges from PMR all the way up to 3800 MHz (5G). And if the frequency plan changes, it's straightforward to readjust the filters. These systems therefore have all future contingencies and requirements covered. Passive systems also significantly reduce the complexity of networks. And to top it off, they resist eavesdropping attempts far better than active solutions and are highly sabotage-proof into the bargain.

Benefits of Passive In-Building Solutions from SPINNER:



No power
consumption



No maintenance
costs



No system
failures



Low investment
costs



Future-proof



Long
useful life

SPINNER Distributed Antenna System (DAS)

SPINNER offers a full range of products and solutions for complete passive In-Building mobile communication solutions. With good planning and smart sectorization, our passive systems can cover large areas and manage high traffic volumes. Maximum coverage at minimal cost!



In-Building Antennas



Combiners



Splitters and Tappers



Jumpers and Cabels



* Connection to base station

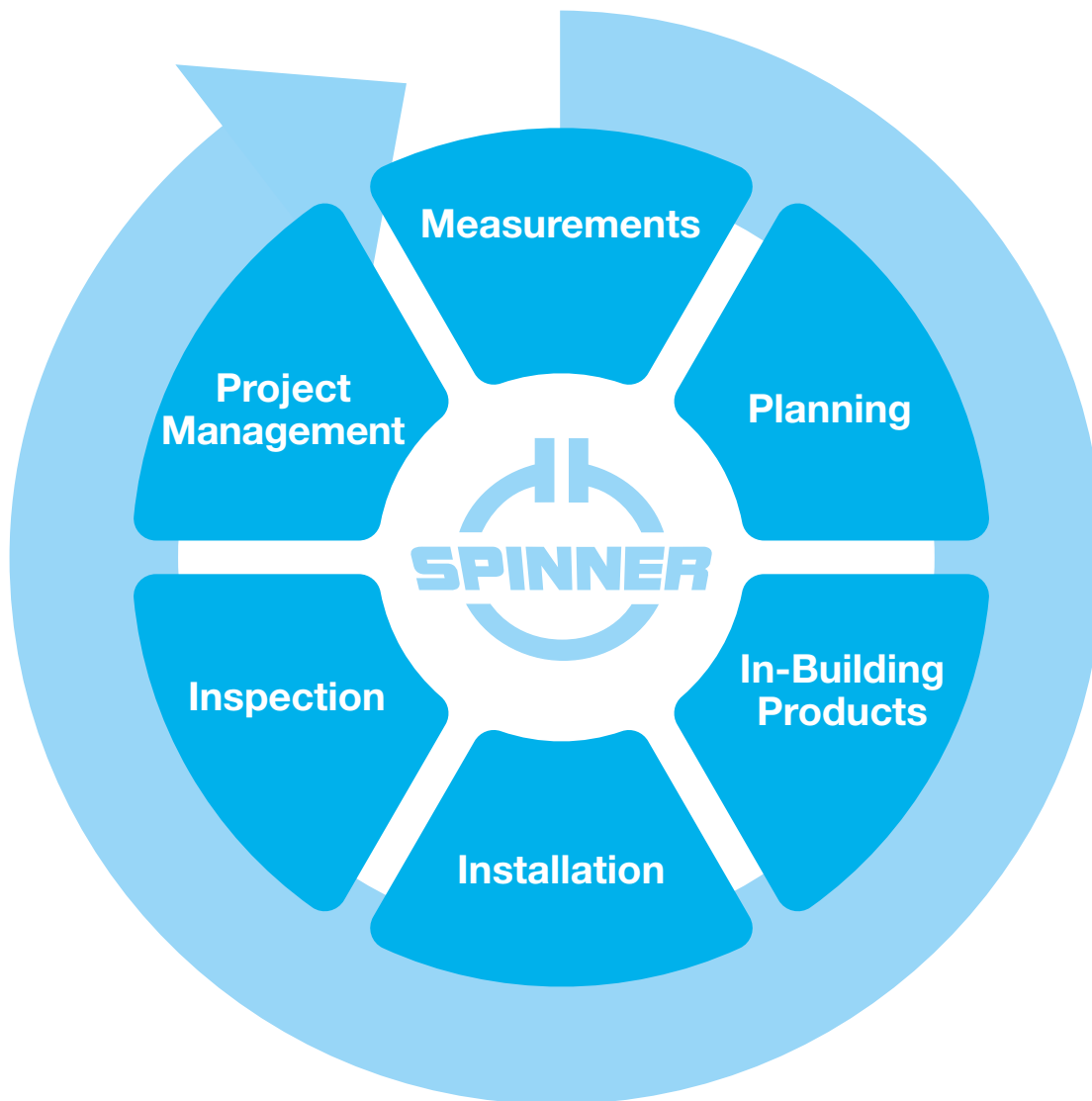
Benefits of the SPINNER DAS

- ✓ Long-lived, sustainable products
- ✓ Future-safe: extendible for GSM, 3G/UMTS, 4G/LTE, 5G, 6G etc.
- ✓ Low PIM** and minimal VSWR for optimal reception
- ✓ Low investment costs (compared to active systems)
- ✓ No maintenance costs, since it is completely passive
- ✓ No power consumption
- ✓ No required checks
- ✓ No system failures since there are no electronics

**Passive intermodulation

360° Service from SPINNER

SPINNER will be happy to help you implement your In-Building project. From identifying the requirements across planning and installation all the way to project management.



- **Measurements:**
 - of required dimensions*
 - for inspections
 - VSWR
- **Planning:**
 - of the design*
 - of execution*
- **In-building products:**
 - Supply of all required In-Building products as specified by the mobile system operators and planning of execution
- **Installation:**
 - All work required to implement your In-Building solution*
- **Inspection:**
 - Checking of the installation using state-of-the-art testing and measurement equipment and methods
- **Project management:**
 - Supervision and coordination of the project from start to finish*

*In cooperation with partners

Wi-Fi vs. Mobile Communications

In office complexes, buildings and other environments, Wi-Fi networks usually fail to provide seamless coverage. It's also common for them to actually comprise multiple networks: it's common for each tenant to have their own. So there is no guarantee that you will be able to make phone calls or check your email everywhere between the building's entrance and your office. Only a mobile communication signal can ensure that.

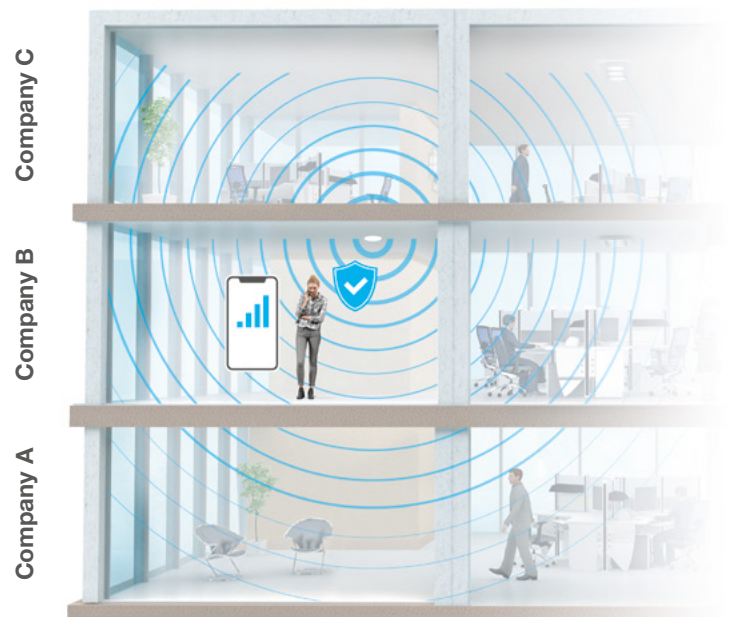
The following facts leave no doubt about why Wi-Fi can't replace mobile communications inside buildings:

- There is **no automatic handover** from one **Wi-Fi network** to the next when moving around. With **mobile communication**, however, this **takes place automatically** and without any detectable interruptions.
- **Wi-Fi networks** have significantly **smaller bandwidths** than mobile communication cells.
- **Wi-Fi signals penetrate buildings less well** than mobile communication signals.
- There is **no step-down switching** from a 5 GHz to a 2.4 GHz **Wi-Fi network**. With **mobile communication** the connection **automatically shifts** to the next available standard (5G => 4G/LTE => 3G/UMTS => 2G/GSM) without interrupting the conversation.
- Although a smartphone can detect **Wi-Fi networks**, it's **unable to automatically log on** to a new Wi-Fi network.
- **Wi-Fi networks are not always secure**, and this applies especially to public networks that don't require users to enter a password. In **mobile communications**, by contrast, **all communications are transmitted in encrypted form**.

WI-FI NETWORKS

vs.

MOBILE COMMUNICATIONS





SPINNER MNCS® enables mobile coverage in **Gardens by the Bay**, Singapore

Our passive in-building technology requires
no power supply or maintenance.

No costs are incurred for operation,
and no parts need to be replaced.



“The SPINNER MNCS® system has already yielded outstanding results in many of our projects. We simply submit our specifications, and SPINNER very quickly builds a tailored, perfectly calibrated system that optimally meets our requirements. The carriers are very effectively isolated from one another, and the passive intermodulation is negligible. Plus, the SPINNER MNCS® gives us flexibility for later extensions,” says Hans Rolf Lopau of Deutsche Telekom AG.

Elbphilharmonie
Hamburg



Our passive systems have already been installed in
more than a 1,000 projects worldwide.



HIGH FREQUENCY PERFORMANCE WORLDWIDE

SPINNER designs and builds cutting-edge radio frequency systems, setting performance and longevity standards for others to follow. The company's track record of innovation dates back to 1946, and many of today's mainstream products are rooted in SPINNER inventions.

Industry leaders continue to count on SPINNER's engineering excellence to drive down their costs of service and ownership with premium-quality, off-the-shelf products and custom solutions. Headquartered in Munich, Germany, the global frontrunner in RF components remains the first choice in simple-yet-smart RF solutions.

www.spinner-group.com

SPINNER GmbH

Headquarters

Erzgiessereistr. 33
80335 Munich

GERMANY

Phone: +49 89 12601-0
info@spinner-group.com

SPINNER Austria GmbH

Modecenterstraße 22/C38
1030 Vienna

AUSTRIA

Phone: +43 1 66277 51
info-austria@spinner-group.com

SPINNER Electrotécnica S.L.

c/ Perú, 4 – Local nº 15
28230 Las Rozas (Madrid)

SPAIN

Phone: +34 91 6305 842
info-iberia@spinner-group.com

SPINNER France S.A.R.L.

24 Rue Albert Priolet
78100 St. Germain en Laye

FRANCE

Phone: +33 1 74 13 85 24
info-france@spinner-group.com

SPINNER ICT Inc.

2220 Northmont Parkway, 250
Duluth, GA 30096

USA

Phone: +1 770 2636 326
info@spinner-group.com

SPINNER Nordic AB

Kråketorpsgatan 20
43153 Mölndal

SWEDEN

Phone: +46 31 7061670
info-nordic@spinner-group.com

SPINNER Telecommunication

Devices (Shanghai) Co., Ltd.
351 Lian Yang Road
Songjiang Industrial Zone
Shanghai 201613

P.R. CHINA

Phone: +86 21 577 45377
info-china@spinner-group.com

SPINNER UK Ltd.

Suite 8 Phoenix House
Golborne Enterprise Park,
High Street
Golborne, Warrington
WA3 3DP

UNITED KINGDOM

Phone: +44 1942 275222
info-uk@spinner-group.com