Antenna Solutions

Evolution of Multi-Band and Ultra-Broadband Antennas
Kathrein as the market leader and oldest antenna manufacturer worldwide has always been seen as the driving force with regard to the newest and most innovative antenna technologies for mobile communication systems. Positive customer feedback constantly proves the outstanding quality of Kathrein products while reaching best-in-class KPIs.

Kathrein’s consequent advancements of antenna technology have led to a new generation of multi-array antennas providing independent columns in a single radome. These multi-array antennas do not only supply a future-proof multiplicity of diverse frequency bands for various technologies, but are also well-prepared for different MIMO-applications whilst providing integrated RET functionality.

### FEATURES / BENEFITS

- Significant CAPEX reduction through just one antenna in type approvals, logistics, installation and service upgrades
- Considerable reduction in OPEX thanks to reduced site/mast rental fees and best-in-class reliability
- Sophisticated antenna design for all networks – today and in the future
- Just one antenna for multiple wireless technologies
- Individual electrical downtilt adjustment per band
- Different half-power beamwidths available
- Various antennas for MIMO applications

### 2-Port Antennas

Kathrein is able to offer a variety of different broadband low-band solutions. Special single-band antennas for LTE 700 are also available, which provide the additional feature of integrated remote control units (iRCU).

- 2-Port Low-Band Antennas
  - 790-960 MHz
  - 698-864 MHz (iRCU)

- 2-Port High-Band Antennas
  - 1710-2200 MHz (ultra-wideband)
  - 1710-2690 MHz (ultra-broadband)

### 4-Port Side-by-Side Antennas

Kathrein’s side-by-side solutions provide the possibility to deploy different technologies and realize site sharing or offer 4 x 4 MIMO with one antenna only.

- 4-Port Side-by-Side Antennas
  - 790-960/790-960 MHz
  - 1710-2200/1710-2200 MHz
  - 1710-2690/1710-2690 MHz
4-Port Multi-Band Antennas
Kathrein offers a variety of dual-band solutions in order to meet a multitude of network requirements. A further reduction in the number of antennas and an improvement of the optical impact is possible by using Kathrein’s fourth generation of dual-band antennas.

4-Port Low-Band Antennas
- 790-862/880-960 MHz (integrated filter)

4-Port High-Band Antennas
- 1710-1880/1920-2170 MHz
- 1710-2170/2490-2690 MHz

4-Port Multi-Band Antennas
- 698-960/1710-2690 MHz
- 698-894/1710-2170 MHz (iRCU)

6-Port Multi-Band Antennas
Kathrein’s unique antenna technology combines three different frequency ranges installed into just one single radome. The design of Kathrein’s triple-band antennas is either realized in filter, stacked or multi-array technology. Available frequency combinations include:

- 790-862/880-960/1710-2180 MHz (integrated filter)
- 790-960/1710-1880/1920-2170 MHz (integrated filter)
- 698-960/2 x 1710-2690 MHz (stacked version)
- 698-960/2 x 1710-2690 MHz (multi-array version, 4 x 4 MIMO)
8-Port Multi-Band Antennas
With the product launch of quad-band antennas, Kathrein offers a new generation of antennas. Four antenna systems are placed in one common radome, where each system is equipped with an independent electrical downtilt mechanism. Kathrein quad-band antennas have a very small width due to the unique filter technology. They are available for different frequencies as filtered or side-by-side multi-array solutions including:

- 790-862/880-960/1710-2170/2490-2690 MHz (integrated filter)
- 790-960/1710-1880/1920-2170/2490-2690 MHz (integrated filter)
- 2 x 790-960/2 x 1710-2180 MHz (multi-array version, 4 x 4 MIMO)
- 790-862/880-960/1710-2170/2490-2690 MHz
- 2 x 1710-2170/
- 2 x 2490-2690 MHz
- 698-862/880-960/
  2 x 1695-2690 MHz

Due to the growing requirements for mobile services along with the limited space on available sites, Kathrein has succeeded in developing high-end multi-array penta- and hexa-band antennas:

10-Port Multi-Band Antennas
Kathrein’s penta-band design offers almost unlimited possibilities for network roll-outs and future system requirements. This multi-array antenna is not only suitable for site sharing purposes but also for MIMO applications such as 4 x 4 MIMO for LTE 1800 and/or 2.6.

- 698-960/4 x 1710-2690 MHz (up to 8 x 8 MIMO)
- 698-960/2 x 1695-2180/
- 2 x 2490-2690 MHz (4 x 4 MIMO)

12-Port Multi-Band Antennas
The next step in antenna evolution is Kathrein’s hexa-band antenna. Besides 4 ultra-broadband high-band systems, this version also offers 2 low-band systems. Each system is equipped with independent tilt adjustment set by FlexRET.

- 698-862/880-960/4 x 1710-2690 MHz (up to 8 x 8 MIMO)
Indoor Antennas
Kathrein offers a comprehensive portfolio of indoor antennas for ceiling and wall mounting. The design of these antennas is characterized by the capability of supplying multi-band coverage. This means only one indoor antenna is sufficient to cover a huge range of mobile communication services from 694 up to 6000 MHz.

Small Cell Antennas
Kathrein as the world’s largest antenna manufacturer offers different antenna solutions in order to support their customers in their effort to deploy small cell outdoor solutions for 3G and LTE. Not only do these antennas meet reliable electrical parameters, the unobtrusive design also minimizes the visual impact especially in sensitive urban areas.

Remote Electrical Tilt (RET) System
Kathrein’s complete RET system works in accordance with the AISG (Antenna Interface Standards Group) and 3GPP (3rd Generation Partnership Project) standard.

COMPONENTS FOR RET
- FlexRET system
- Slimline Remote Control Unit (RCU) with RFID feature
- Antenna Line Configurator (ALC)
- Portable Control Adapter (PCA)
- Central Control Unit (CCU)

Besides small cell or indoor solutions, Kathrein offers different outdoor VPol Panel and Omni antennas. Please contact us for more information.

Further accessories are available. Please ask for further information about the new RFID features and the FlexRET system.
In general, all 2-port single column antennas are suitable for 2 x 2 MIMO. Due to emerging mobile applications and the necessity for higher download rates, operators will be forced to offer higher order MIMO solutions in order to satisfy their subscribers. Kathrein’s new outstanding multi-array design will be one of the key elements required to reach the goal of high quality networks. In terms of high-order MIMO requirements, Kathrein is already able to offer certain antennas, e.g.:

**Up to 4 x 4 MIMO**
- 1710-2180/1710-2180 MHz
- 1710-2690/1710-2690 MHz
- 698-960/2 x 1710-269 MHz
- 2 x 790-960/2 x 1710-2180 MHz
- 2 x 1710-2170/2 x 2490-2690 MHz

**Up to 8 x 8 MIMO**
- 698-960/4 x 1710-2690 MHz
- 698-862/880-960/4 x 1710-2690 MHz

Kathrein’s portfolio contains a wide range of antenna line products such as filters, combiners and double tower mounted amplifiers (DTMAs):
- Filters for pre-selection and duplexing applications
- Dual-band, triple-band and quad-band combiners
- Various Autosense Combiners available
- Hybrid combiners
- System components (e.g. DC-stops, Smart Bias Tees)
- DTMAs for e.g. GSM, UMTS and LTE:
  - AISG and/or CWA (Current Window Alarming) capability
  - Excellent noise figure, low insertion loss, various gain performances available
  - Single and dual-band/special bypass-solutions
- Same-band combiner:
  - Enables antenna and feeder sharing for two base stations in the same frequency band
  - Suitable for two operators with frequency allocations within the same frequency band
  - Very low Tx/Rx insertion loss (<0.5 dB/<0.6 dB) compared to standard hybrid combiners (3 dB)
  - Suitable for indoor and outdoor applications
  - DC/AISG by-pass for DTMA supply

Please ask for further information regarding our antenna line devices.