Smart basestation antenna for next generation mobile communication

Peter Meyer
Airrays GmbH
Airrays is providing a groundbreaking technology for cellular base station antennas that increases capacity by a factor of 10 and more keeping cost at the same level.
Capacity increase using beam forming antennas

Problem:
Wireless transmission is growing dramatically!

- Transmission is doubling every 18 month
- Revenue is remaining flat

Solution:
Increase capacity using multiple beams!

- Focus of energy: Energy 1/10
- Multiple beams: Capacity x 10
Airrays Approach/Solution

1. **Power by scaling**

Instead of one big radio-antenna unit, take 100 small ones.

\[ 10 \text{ W power} \times 100 \times 0.1 \text{ W power} = 10 \text{ W} \]

2. **Beamforming by synchronization**

Synchronize 100 radio-antenna units to form multiple beams.

Array of radio-antenna units

Multiple beams

3. **Modularization**

To facilitate synchronization, create modules.
Airrays develops Key IP
- SW
- HW
- Algorithm IP implemented on FPGA

Airrays develops Radio Module
- Standard components
- Special interfaces

Radio Module are combined with Antennas

Products
Airrays integrates modules to form complete Radio Units
These are active antenna systems with interface towards baseband for different use cases.

Customer
Antenna Manufacturer
- Amphenol Antenna Solutions
- CommScope
- Kathrein

Established OEM’s
- Alcatel-Lucent
- Samsung
- Ericsson
- Huawei
- NEC

New Entrants
- Corning
- Ip access
- Altiostar
- Airvana

Small Cell

Competitors
Chinese infrastructure provider
- Huawei
- ZTE

Differentiators
Capacity Gain
- Up to factor 10
- Key component for 5G

Scalable
- Different Size and Shape
- Distribute Signal processing

Easy to use
- Fully electronic adjustments

Airrays Gmbh
Semicon/Innovation village
06. October 2015
Base Station Market

• Market 2020
  – 2 Million Macro Basestation
  – 10 Million Small Cell Basestation
• Beginning 2018 capacity becomes an issue leading to replacement of 4G antennas.
• Beginning 2020, 5G standard will be rolled out replacing older technology.
• Airrays technology can be used in current 4G system and will become a lead provider for 5G (Massive MIMO)
• Multi Billion $ Market
Development plan & Roadmap
Schrittweiser Einstieg in den Markt

Looking for partnerships
• Baseband solution (will become integrated into antenna)
• Cost reduction (via ASIC development)

Turnover

Investment
Seed: 1.5 Million
Series A: 4.5 Million
Series B: dependent on growth and ASIC
Profitable

Development
Start Prototyp
Prototype available
First generation product available
Second generation product available
High volume product ASIC for cost reduction

2015
2016
2017
2018
2019
2020

200 k €
0.5 Mill €
4.4 Mill €
50 Mill €
125 Mill €

4.4 Mill €
Gen 1
+ Gen 2
von
+ Gen 2

Airrays Gmbh - Semicon/Innovationvillage 06. October 2015
Team

Excellent network in wireless and in semiconductor industry

Growth plan to develop product with highly qualified engineers

- 15 in 2016
- 30 in 2017

Two successful exits with Technology-Start-Ups for wireless transmission systems

Dr. Peter Meyer
Managing Director

Dr. Volker Aue
CTO

Dr. Wolfram Drescher
Advisor

Prof. Gerhard Fettweis
Advisor

Dr. Albrecht Fehske  Dr. Michael Grieger  Dr. Jan Dohl

3 PhD Graduates
4 years experience in advanced network-architectures

30 in 2010

2003

Strong relationship to Vodafone-Chair of TU-Dresden

Dr. Michael Grieger

Dr. Jan Dohl

Dr. Peter Meyer

Dr. Volker Aue

Dr. Wolfram Drescher

Prof. Gerhard Fettweis

Airrays Gmbh - Semicon/Innovationvillage
06. October 2015
Thank you
Airrays GmbH, Kramergasse 4, 01067 Dresden
info@airrays.com