

## Blue Danube Systems First to Demonstrate Benefits of FDD Massive MIMO in Clustered Multi-Sector Deployments

*2X capacity improvement achieved over entire coverage area, eliminating edge interference as a major barrier to large scale network adoption*

**SANTA CLARA, Calif. –February 22<sup>nd</sup>, 2018** – [Blue Danube Systems](#), a provider of intelligent wireless access solutions that help mobile operators address the challenge of explosive data growth, today announced it has successfully expanded the commercial deployment of its massive MIMO solution to multiple clustered cell sites, demonstrating total capacity improvements for directly adjoining sectors on existing LTE networks using current smartphones.

Despite the prevalent view that Massive MIMO systems will be central to 5G networks, it has not been clearly proven that the technology is deployable beyond isolated high-demand sectors where effects such as adjacent cell interference must be addressed. In fact, common digital-only Massive MIMO implementations typically operate as closed single-sector solutions, spilling unwanted Radio Frequency (RF) energy across cell edges and potentially degrading adjacent sector performance. In contrast, Blue Danube's approach to Massive MIMO starts by assuring RF array coherency which in conjunction with digital processing uniquely enables the definition, placement and dynamic coordination of high precision beams that can be software engineered to minimize adjacent sector interference and actually improve clustered cell performance.

Using its BeamCraft™ 500 Massive MIMO systems, Blue Danube performed multi-sector beam optimization at two different sites within the FDD-LTE network at a US mobile operator. Leveraging the machine learning intelligence of the cloud-based software platform BeamPlanner™, RF patterns were generated to optimize and coordinate inter-cell and inter-sector performance. Using only two beams, improvements of 1.7 to 2.0X were demonstrated in total downlink capacity over both multi-sector locations. Additionally, critical cell edge locations saw a dramatic 7dB increase in signal quality due to BeamCraft's precision beam control leading to 1.7X improvement in individual user download speed. Blue Danube further expects capacity improvements of 5X or more by increasing from two to four beams in future trials and will begin operation in March with a second mobile operator at a multi-sector dense urban location.

By combining precise dynamic beam control with open system interfaces, Blue Danube is engineering its Massive MIMO suite of products to interoperate with other industry network resources such as Self Optimized Network (SON), Centralized Radio Access Network (CRAN) and Open Network Application Platform (ONAP) software along with geolocation and mobile application driven analytics. Combined with BeamPlanner, these capabilities enable operators to use intelligence about their network and customer use to deliver the highest level of overall system-wide performance.



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“We are excited to be the first in the industry to successfully demonstrate capacity improvement for clustered multi-sector Massive MIMO deployments,” said Mark Pinto, CEO of Blue Danube Systems. “Adding to our recent announcement of the first multi-band Massive MIMO products, we are making available powerful and flexible tools for operators to seamlessly insert 5G-ready technology into their existing LTE networks for substantial system-wide capacity gain.”

“Cell edge performance continues to be a major challenge for pure digital Massive MIMO systems,” said Shiv Panwar, Professor of Electrical Engineering at NYU and Director of the New York State Center for Advanced Technology in Telecommunications (CATT). “This is the very first demonstration of Massive MIMO performance in a clustered deployment. Blue Danube’s multi-sector BeamCraft results are very exciting and demonstrate that Massive MIMO is now viable for wide-scale adoption in FDD networks.”

“Until now, we have only seen Massive MIMO deployed on individual sectors, not on multiple sectors facing each other,” said Joe Madden, Founder and Principal Analyst at Mobile Experts. “Blue Danube’s results on clustered Massive MIMO deployments represent a critical milestone, provide compelling evidence that the technology can have broad impact across entire operator networks.”

### **About Blue Danube Systems**

Blue Danube Systems is a privately held start-up backed by Sequoia Capital and Silver Lake along with other investors including AT&T. Blue Danube’s unique, award-winning technology combines intelligent software and hardware into a Massive MIMO solution that enables a significant increase in network capacity, utilizing existing infrastructure and today’s mobile devices. For more information, please visit [www.bluedanube.com](http://www.bluedanube.com)

### **Blue Danube Participation at Mobile World Congress 2018**

Blue Danube will have representatives at Mobile World Congress from February 26 through March 1 in Barcelona. Blue Danube can be found in Hall 2, hospitality stand 2L10.

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