

# TESTING WiMAX-CERTIFIED EQUIPMENT IN CROATIA



When Zagreb-based systems integrator, **MICRO-LINK**, wanted to drive test a variety of WiMAX-certified base stations and subscriber terminals, it turned to Anritsu. **MICRO-LINK** used one of the first test samples of the vendor's *BTS Master*, a sophisticated measuring device that enabled the company's engineers to evaluate trial and commercial WiMAX networks. They were so impressed with the *BTS Master* that they ended up buying one!

**M**ICRO-LINK d.o.o. based in Zagreb, Croatia, specialises in integrating radio communication technology systems in the region. In November 2006, following its long term efforts in the promotion and application of some of the most advanced technological solutions, the company's engineers performed extensive laboratory and field measurements of WiMAX radio equipment. The hardware was designed for the development of telecommunication networks which enabled broadband wireless access to triple play services.

Laboratory and field measurements were realised with what was, at the time, one of the first test samples of Anritsu's *BTS Master* measurement equipment. The instrument was made available to **MICRO-LINK** for two reasons: firstly it was used to perform test measurements of WiMAX certified equipment; and secondly it would help Anritsu obtain valuable field input data that would be useful in the further development of the *BTS Master*.

*BTS Master* is a "next generation" measurement instrument that comprises a wide range of functionalities. Its light and portable, but still highly robust housing, makes it ideal for field operation. The unit implements a dual Frequency Domain Reflectometer (FDR) that operates in frequencies up to 6GHz and enables detailed analysis of all relevant RF transmission line parameters and antenna systems. It also features a high precision and high sensitivity spectrum analyser system with integrated power meter, both operating in RF frequencies up to 7.1GHz. *BTS Master* is one of the first systems in the world that enables



**Above:** A **MICRO-LINK** field test vehicle during RF measurements performed on WiMAX networks. **Below:** Anritsu's *BTS Master* is robust and comprises a wide range of functionalities

detailed specialised measurements of WiMAX-certified, interoperable systems. It enables demodulation of WiMAX radio signals with the purpose of verification of all relevant radio interface parameters of WiMAX equipment.

Furthermore, *BTS Master* includes a frequency selective interference measurement module with time correlation functionality, and the possibility to scan RF channels and receive GPS positioning information. All measurements can be stored in an internal or external USB memory for later analysis on a computer connected via USB or Ethernet connection.

During the test period, **MICRO-LINK** engineers performed a series of detailed measurements on several types of WiMAX certified radio systems: *RedMAX AN-100U* base stations and SU-O subscriber terminals from Redline Communications, *PacketMAX 5000* base stations and *PacketMAX 100* subscriber terminals from Aperto Networks, *MacroMAX* base stations and *ProST* and *EasyST* subscriber terminals from Airspan

Networks, and Alvarion's *BreezeMAX μBST* base stations and *BreezeMAX PRO* subscriber terminals. The measurements were performed in laboratory and on implemented live networks in trial or commercial operation. They tested all radio and WiMAX physical (PHY) layer parameters, interference, interoperability and performance. The drive test results were correlated with GPS obtained coordinates in order to verify the radio signal propagation predictions.

Based on received insight into the technical characteristics and possibilities of the *BTS Master* measurement instrument, **MICRO-LINK** decided to purchase this technologically advanced integrated RF measurement platform. The company hopes that the device will enable engineers to carry out more effective, high quality realisation, implementation and optimisation of radio links/networks, especially in the field of TETRA systems and foremost fixed/nomadic and future mobile WiMAX radio networks. ■

