

## Product of the Month

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Product of the Month – Telecommunications Magazine

### Dyaptive Systems Takes the Guesswork Out of Cellular Planning



In 2003 alone, US Bancorp estimated that wireless carriers collectively spent \$36 billion on wireless infrastructure. inCode Telecom reports that 12 percent of this total was for network optimization and deployment. Despite the cost of these elements, wireless operators have not had a cost-effective tool other than the ‘Can you hear me now?’ method for predictable and repeatable tests of problems an operator may encounter in the field.

Enter Dyaptive Systems and the DMTS (Dyaptive Mobile Terminal Simulator)-8000. Designed for CDMA-based operators and base station manufacturers, the DMTS can test and optimize peak-load performance for both voice and data traffic. So what’s Dyaptive’s secret sauce? By applying SDR (software defineable radio) technology, Dyaptive can support an equivalent load of up to 2,000 mobile terminals that generate more than 2 million BHCA (busy hour call attempts). Instead of having to hook up racks of mobile phones, commonly known as “load boxes,” Dyaptive’s system can support what it calls VMTs (virtual mobile terminals). No matter how many VMTs are utilized, the system only requires a single RF connection per sector.



**DMTS-8000**

“With the growing mix of voice/data apps, and the mix of folks using them, carriers will have to do more/better planning and testing to get their engineering right,” said Deb Mielke, managing director of Treillage Network Strategies. “A test platform like Dyaptive’s could be a big help. And, with consumers having a lot more freedom to move around now, ensuring a quality experience gets to be a lot more important.”

Dyaptive combines SDR technology with its proprietary FPGA (field programmable gate array) and DSP algorithms to create what it calls a ‘shared physical layer’ architecture that can scale to a large density of VMTs. As carriers move up in the CDMA 3G lifecycle, the DMTS-8000’s software upgrade ability can perform all IF (intermediate frequency) and base-band processing by reprogrammable hardware and software to support any 2G, 2.5G and 3G CDMA protocol revisions.

The DMTS can be deployed in multiple configurations. In its minimum 19-inch single chassis cabinet configuration, the DMTS-8000 consists of a control computer and a PE (processing element) interfacing RF sector I/Os of one or more base stations. This configuration can house up to 11 blades to support a total of 528 VMTs. From there, it can scale to four chassis housed in a tower with eight transceivers and 44 PEs to support a total of 2,112 VMTs. Multiple chassis can be daisy-chained to form a single system.

Through the configurable VMT element, the DMTS can create multiple test scenarios, including capacity testing, simulating peak-hour network usage, boundary condition testing, verification of proper error handling and network recovery, protocol revision and feature testing, and network behavior when new protocol features are enabled. By integrating an advanced scripting mechanism, a carrier can define and execute various test scenarios representing real-world conditions. A wireless carrier could, for example, create base station or network failures and then determine the cause of such failures.

An optional channel simulation module can introduce independent impairments of the forward and reverse links of each VMT. These impairments are soft programmable to model various RF path and fading profiles, all of which can be individually configured for each VMT. In addition, the product has detailed logging of events and transactions at every layer of the protocols for each VMT that can't be obtained through a handset's MDM (mobile diagnostic monitor).

Dyaptive's approach is getting the attention of wireless operators such as Sprint PCS, which is evaluating the system as a way to test the mixed voice and data network.

"I would have to say going the extra mile to detect and solve capacity problems with a tool like this is easier," said John Fessler, principal engineer for customer equipment certification for Sprint PCS's CDG System Test Team. "It takes more work, but it's the type of work that pays off. As the data-testing capabilities come on, I am sure we'll use it for that purpose too, because the potential for the data network to stomp on the voice network is there, so having a tool that provides a voice/data optimization will pay off for us."

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