

Connected Solutions for 3G

A connected solution is a set of design tools and test equipment operating together to provide a powerful development environment for reducing design iterations and improving time to market.

It is commonplace for the design and prototype test phases of the development process to be performed with few interactions between these two phases. When designs are created in the software environment, only simulated tests can be performed before a prototype is built. Prototype tests are performed in the hardware environment. They are performed first on the individual prototypes or subsystems, then on the entire system after all subsystems have been completed. Hewlett-Packard's comprehensive, connected set of W-CDMA design tools and test equipment bridges the gap between the design and prototype phases to reduce product development time.

Design Optimization

Using a connected solution as shown in Figure 1, the output of the IF/RF upconverter, which exists in the software environment, is converted into a real-world signal to drive an actual power amplifier. The benefit of this connected solution is that the adjacent-channel power ratio (ACPR) or complementary cumulative distribution function (CCDF) measurement results can be interpreted by the designer so that the pre-distortion algorithm can be adjusted. Without the connected solution this would have to be done after all the subsystems in the diagram were physically prototyped, which is costly and time

consuming. The link between the two environments allows for an iterative feedback process. This process, crossing the boundary between real hardware and virtual software simulation, is only possible with a connected solution.

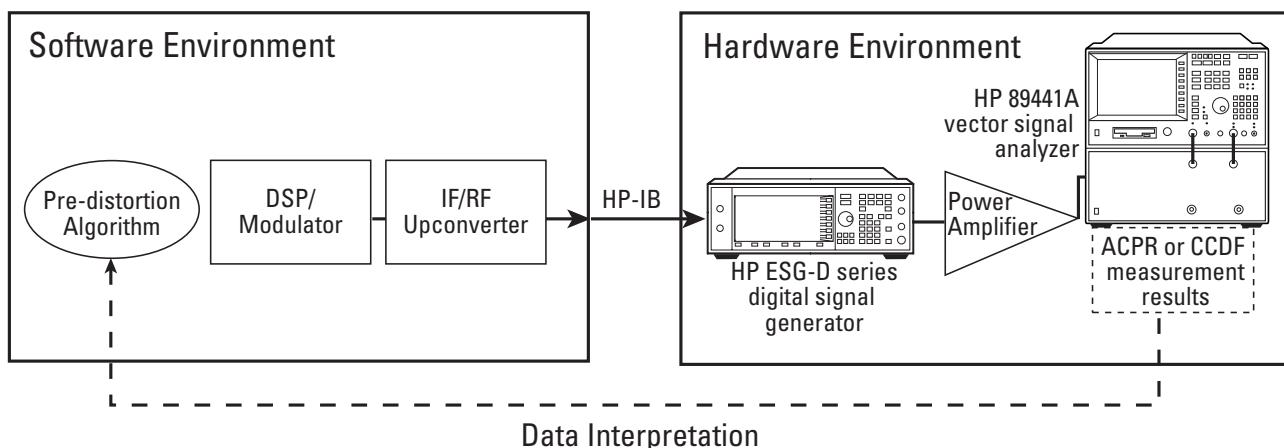


Figure 1. Optimize the DSP pre-distortion software design using measured data

Subsystem Substitution

Once a system has been modeled and prototype subsystems have been built, the challenge is to integrate them. A connected solution helps with this challenge by allowing design tools and test equipment to substitute for unfinished subsystems. In the example shown in Figure 2, the modulator/upconverter design in the HP Advanced Design System and the HP ESG-D series digital signal generator substitute for the unfinished prototype. The HP 89441A vector signal analyzer captures the output signal from the baseband section prototype. This captured data is used as the input source for the modulator/upconverter design. Using this process the baseband section and power amplifier prototypes can be tested as if they are part of a complete system. This can decrease the time needed to evaluate and troubleshoot the system.

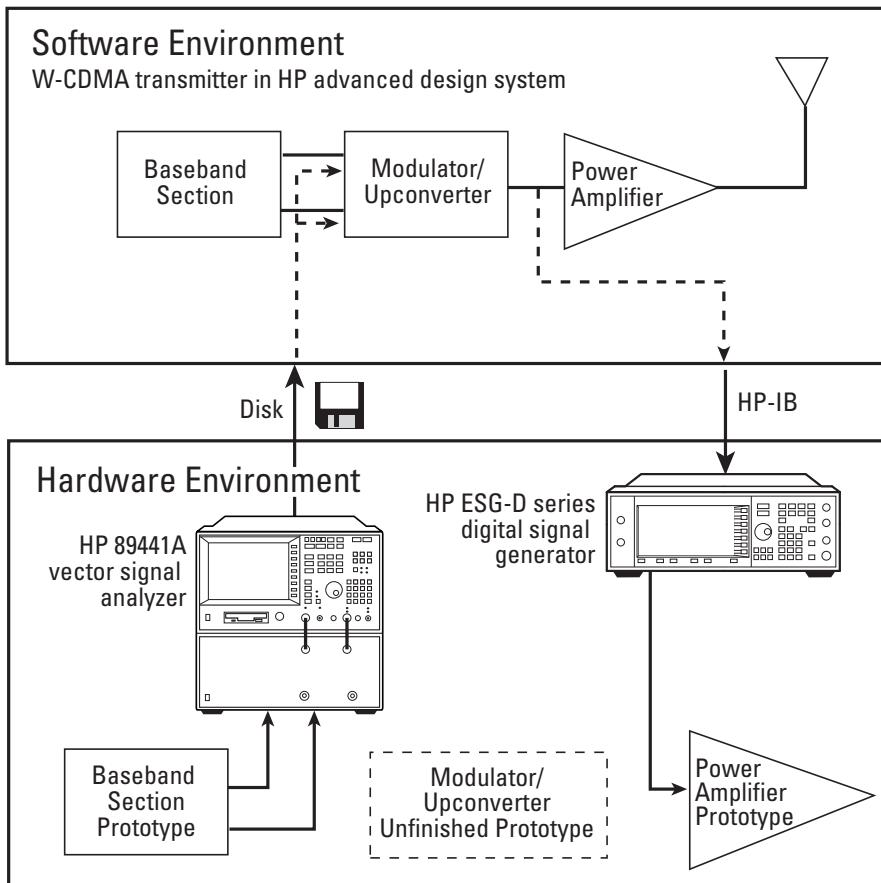


Figure 2. Substitute design tools and test equipment for unfinished prototypes

Connected Solutions Improve Time to Market

History has shown that being first to market in the dynamic wireless communications industry has obvious advantages. Finding a way to reduce design time is an essential element in decreasing time to market. Both of the examples above show how a development environment using connected design tools and test equipment can improve your time to market for 3G-product development. And, as 3G standards continue to evolve, HP's set of design tools and test equipment, and their connected capabilities, will also evolve.



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