

Integrated WWAN Functionality Increases In Laptops And Tablets

Rugged laptop and tablet vendors are improving integrated WWAN (wireless WAN) antennas for optimum uptime.

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A successful, competitive field service solution demands wireless capabilities for all of the essential communication to and from the field. Rugged tablet and laptop manufacturers are recognizing the value of wireless connectivity and are integrating antennas into their products. A recent study by Venture Development Corp. (VDC) reports that, in 2006, 70% of rugged mobile computers had some type of integrated wireless antenna. The study predicts that by 2010 more than 90% of rugged computers will have integrated wireless capabilities, stressing the importance of multimodal wireless (the presence of two or more different wireless radios, such as GPS [global positioning system] and WWAN). Nearly all rugged laptop and tablet manufacturers produce integrated quad-band radios which accommodate the four main types of wireless connectivity: WLAN (wireless LAN) (i.e. Wi-Fi) or WWAN (i.e. wireless broadband), GPS, and Bluetooth. One of the key productivity enhancers in the field is wireless broadband. It is also the most challenging for mobile computer manufacturers, because it is constantly changing. What follows are ways rugged vendors are addressing this issue of WWAN functionality so your techs can work more efficiently and consistently in the field.

WHY INTEGRATED WWAN ANTENNAS?

You've no doubt seen the plethora of wireless broadband PC-slot cards available. Those cards are a great option for road warriors and/or traveling executives who want fast, near-constant wireless connections. But PC cards are not a good fit for environments where rugged computers are used. You've invested money in rugged laptops or tablets, which are put through rigorous testing to meet drop, water, dust, and vibration specs. A nonrugged card inserted into a PC slot is not part of this configuration. When users insert an off-the-shelf PC card, they open a door on the side of the computer, so there is actually an unprotected opening which compromises the rugged integrity of the device, says Patrick Gray, director of product marketing for rugged computer manufacturer Xplore Technologies. If you drop the computer and it lands on the wireless card, you not only can damage the card but also the computer, from its housing to the motherboard.

Additionally, PC cards are not necessarily tuned and optimized for performance. When manufacturers integrate wireless radios and antennas, they usually strategically place them far away from the microprocessor to minimize or eliminate electronic noise and interference, says Richard Lawson, president of mobile computer reseller Group Mobile. This isn't the case with PC cards they're inserted wherever the slot is. The noise generated by a processor can sometimes interfere with a PC card's reception. This isn't going to cause disruption in urban areas, but in fringe areas there will be a lot of problems with dropped connections.

Rugged computer manufacturers are investing engineering time and money on antenna placement research and testing to ensure there is minimal interference. The manufacturers test and refine the placement and cabling of antennas. They also work closely with wireless module manufacturers (such as Sierra Wireless) to stay on top of antenna development road maps and new specs. We actually require certain antenna hearing specs in the RFPs we solicit from modem manufacturers, says Vicky Obenshain, director of wireless strategy for Panasonic Computer Solutions Company (manufacturers of Panasonic Toughbooks). These requirements are for diversity and equalization. The former is for better coverage footprints on the fringe of the network; the latter deals with congestion in metro networks that can sometimes prevent users from getting or maintaining a connection.

INTEGRATED WIRELESS CARDS ARE FIELD-UPGRADEABLE

One can make the argument for PC-slot cards because they're easily interchangeable. If you change carriers or your carrier upgrades its network (which is happening with more frequency), you simply get a new card and insert it. With integrated cards, there is a worry that you'll need to send the device out for the card to be replaced, which was the case not too long ago. In the past, wireless modules were hard-embedded in the devices, so to change them meant pulling computers out of the field, where they had to be retrofitted by trained IT/configuration integrators, then redeployed to the field, says Obenshain. So, there was an expense and productivity loss involved.

Now, manufacturers have modified the wireless modules and integrated cards so that they can be upgraded by the users or at least the users' IT shop. This is largely because many manufacturers have moved toward modular antennas that is, the antennas are integrated within the computer, but in a specialized modular compartment that can be accessed by removing a few screws. Users will definitely want to upgrade or change WWAN radios during the product lifetime, so it's important that they're able to do it relatively easily, says Tim Talda, director of product line management for handhelds and tablets at Itronix Corp., a General Dynamics Company. This is especially important because rugged computers are generally used for three to five years, and wireless technology changes every one to two years. With a modular strategy, everything is sealed to maintain the ruggedness of the computer. Companies in this space need both changeability and ruggedness not one or the other. Another method for upgrading the wireless modules is in the form of a firmware upgrade, which can be done transparently over a wireless network.

The one additional argument that can be made for the benefit of PC-slot cards is that wireless carriers AT&T (formerly Cingular), Verizon, Sprint Nextel, T-Mobile offer large discounts on the card prices for signing up for service. Most cards end up costing \$40 to \$50, with monthly data plans costing \$50 to \$60 per month, per user. With integrated cards, the data plans will be about the same, but the integrated module and associated engineering costs may be reflected in the price of the rugged device. Cost is still an issue with integrated cards, but I predict that will change in the near future, says Lawson. I know device manufacturers are in discussions with carriers to subsidize integrated cards. There aren't announcements yet, but we might see them soon.

With optimized, integrated WWAN functionality, you can gain efficiencies in the field that were once impossible due to slow connections. Utility workers can perform more sophisticated types of repair work because they can download large files of schematics or repair manuals. Give your cable installer

access to CRM (customer relationship management) and sales data, so he can upsell customers with additional service or digital phone lines. Field techs can perform more advanced repairs or more accurately diagnose problems by talking to engineers from the field via Web cameras and streaming video. Field service productivity is improved because workers have all the information they need via the rugged device and the wireless network.

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