

Wiring the tactical vest

With its award-winning plug & use Freedom Series, Fischer Connectors is reimagining the role of connectivity in communications, sensing and protection of ground forces

Military organizations around the world have been working on the seemingly impossible task of reducing the size and weight of soldiers' equipment while simultaneously increasing functionality and power. For engineers dealing with connectivity issues, this has brought about smaller and smaller connectors, cables, and devices. Weight is a particularly vital consideration for dismounted soldiers, who typically carry more than 80lbs. Given that each soldier wears a backpack and body armor and carries weaponry and ammunition, achieving the desired 20-25% reduction in weight requires rethinking the design and packaging of many types of electronic and communication equipment. For instance, night vision, targeting systems, smartphones, GPS, tactical computers, and communications equipment could be integrated into a very functional and reliable subsystem requiring

an array of cables, harnesses, and connectors. All of this equipment is necessary, so product manufacturers must work with their component partners to find ways to shave small amounts of weight from each component in order to achieve significant weight loss.

Looking beyond the equipment itself can yield weight savings that can't be achieved by looking at individual devices alone. This approach is changing the way that dismounted soldiers will protect and engage in the future, as prime contractors fiercely compete to cut weight from soldiers' burdens, while still ensuring that every piece of tactical gear, and particularly sensing and communications devices, remains at the ready.

There's nothing closer to the soldier than the tactical vest. These vests have long carried soldiers' gear, protective shields, and ammunition, and there is currently an effort to bring new wearable connectivity technology with essential



Tactical vests for today's dismounted soldiers can be outfitted with an array of devices that support expanded abilities, such as cameras and video screens, and can be cabled to headgear for communications. Rugged, low-profile connector receptacles sewn directly into the fabric and matching plugs built directly into devices can significantly reduce, or even eliminate, the use of cables.



The versatility of the breakthrough plug & use technology offered by the new Fischer Freedom™ Series makes it ideal for wearables and for a multitude of Dismounted Soldier, Ground, Aerospace and Marine applications.

FISCHER FREEDOM™ SERIES



The Fischer LP360™ connector, the 1st product in the Fischer Freedom™ Series, is rated for 10,000-cycle durability in even the toughest environments. In 2018, it won two prestigious awards for technological innovation: the Innovators Award from Military & Aerospace Electronics, and the Leadership in Engineering Achievement Program (LEAP) Award from Design World.

communications gear and electronic sensors to tactical vests. Connectivity solutions for tactical vests can provide new protections for dismounted soldiers, as well as a single source of power capable of supplying a variety of devices, but must be rugged enough to withstand the harshest environments, weather conditions, shock, and vibration.

The concept is simple. Integrating a distributed data and power bus into the tactical vest eliminates the need for the external wires or break-out cables that currently weigh soldiers down. Receptacles sewn into the vest and attached to the bus connect to devices and deliver power and signal, and a single battery pack powers all the devices. Communications gear, sensors, flashlights, cameras, viewfinders, GPS devices, and other essentials can be attached with matching plugs built directly into the device without the use of cables. This approach to tactical connectivity is part of an overall trend to integrate more wearable technology into military gear to help reduce weight and simplify use.

For instance, wired vests with an integrated bus offer two main application benefits. The first is the single central source of power, which eliminates the need for multiple and different batteries for each of the individual devices and helps enable miniaturization, better weight distribution, and overall weight savings. The second is that integrating the plug directly into accessories and devices reduces the need for external wires that could get caught, pulled, or cut in critical moments. Fewer external wires also equate to reduced complexity, improved ease of use, and enhanced flexibility for soldiers in the field.

The wired tactical vest is part of an overall trend toward wearables in defense that is expected to double in the next decade. Several companies have already started building

vests, devices, and sensors based on these concepts, and are testing them in multiple countries.

New connector technology is a critical element of the rapidly expanding market for wired tactical vests. One such solution is the new Fischer Freedom™ Series connector, which has seven concentric rings on the receptacle that allow for 360° mating freedom and a plug with a sealed membrane that protects the contact block with an IP68 rating. Sensors can be built into plugs, or plugs can be engineered directly into devices to eliminate cables entirely. The low-profile plug can also be cabled for communications gear and other devices that do not need to be directly connected to the bus for power or signal.

On the battlefield, wearable devices and displays can play a vital role in situational awareness and improved efficiency. Since soldiers' performance is entirely dependent upon their physical condition, armed forces are starting to equip them with smart biosensors capable of sensing, monitoring, and relaying information about soldiers' vital signs and injuries. Various types of sensors can be attached to soldiers' uniforms to monitor their breathing, heart rate, and hydration, for example, and these sensors can now be woven into smart clothing or integrated into tactical vests. Smart clothing's wireless communication capabilities can also enable soldiers' location, safety, and potential hazards to be monitored with greater accuracy.

Until recently, interconnected and portable devices have primarily been used by soldiers on covert operations. Now, wired tactical vest technology is rapidly extending the concept of wearables well beyond special forces, to all dismounted soldiers, by making these utilitarian garments more modular, more accessible, more capable, and more affordable. ■