

At a Glance

What it is

■ The Power Management Kit (PMK) is a lightweight universal system that powers Explosive Ordnance Disposal (EOD) Platoon equipment and charges the squad's batteries, replacing a large number of batteries and individual chargers. The PMK is extremely effective in austere operating environments.

How does it work

■ The 1-pound Soldier Power Manager (SPM) charges all standard batteries from almost any energy source including, vehicle, solar and alternating current.

■ SPM powers equipment (radios, laptops, x-ray generators, etc.) from almost any military or commercial battery (BB-2590, DeWalt, etc), converting voltages as needed.

■ Six universal power ports permit versatile operation of powering devices, managing energy sources and charging up to five connected batteries. All the functions can occur simultaneously.

What it will achieve

■ The PMK reduces weight, size and number of batteries and chargers the Warfighter currently needs to carry to power his or her gear. Initial measurements indicate the PMK, with all cables and the SPM in a soft roll case weighs nine pounds, replacing up to 50 pounds of specialized chargers and related equipment. Based on mission, the EOD operator chooses the right components from the PMK required in the field.

Point of Contact

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The PMK eliminates the single-purpose chargers in use today by utilizing an energy source while simultaneously charging almost any military rechargeable battery (or DeWalt battery) and also powering any attached gear. Military rechargeable batteries and a Protonex power unit (the SPM) were used to allow the PMK to power the diverse set of gears used by the EOD teams. "Smart" cables were developed to link the SPM with EOD-specific equipment. New pieces of gear can be supported by merely providing a new cable. The SPM itself never requires an upgrade.



When powering equipment from attached batteries, the SPM uses power from these batteries sequentially, using up the least-charged battery first, the next least-charged battery and so on, allowing the Warfighter to jettison a fully-discharged battery and the associated weight as soon as possible. When charging batteries, the SPM prioritizes charge, applying available power to the most charged battery first, and then the next most-charged so the Warfighter has access to a fully charged battery as rapidly as possible. The SPM automatically recognizes the optimal charge algorithm needed by each attached battery and monitors each battery for safe charging conditions. This will abort the charge and warn the user if an unsafe condition exists, allowing for "set and forget" charging capability.

"The PMK gives the Warfighter real-time awareness of power usage and availability, while also lightening his load," said Phil Robinson, Protonex Technology Corporation vice president and principal investigator for the PMK project. A graphical interface displays information about batteries and sources, power usage, state of charge and operational details. This data is stored every few seconds and can be uploaded to an Excel file at the end of a mission for thorough analysis of the power used by each device at each stage of the mission. This capability gives the EOD team unprecedented visibility when planning future missions. By enabling the effective field use of alternative energy sources like a solar cell-covered blanket and fuel cells, it reduces the logistics associated with a large variety of batteries and dramatically reduces the amount of energy discarded in partially used batteries. The PMK can greatly reduce a Warfighter's energy cost and significantly lighten the soldier's carry weight by reducing the number and variety of batteries needed to power his suite of gear.

The PMK project initiated in response to a request from returning Warfighter's attending Unit Level Training at EOD Training and Evaluation Unit TWO (EODTEUTWO). TechSolutions asked to provide a universal charger and power management solution. To perform the PMK project, TechSolutions selected Naval Surface Warfare Center (NSWC) Crane in partnership with Protonex Technology Corporation and Science Applications International Corporation (SAIC). The program launched in mid-2010. After meeting with end users, and EODTEUTWO Combat Development, the developers produced initial concepts, which were reviewed by the unit in November 2010. The SPM, cables and roll kit were approved by the Warfighter and Power Management Kits are currently in the hands of EOD operators preparing for combat deployment.