

THE MOST VERSATILE COMPONENT IN YOUR I3MP TECHNOLOGY ARSENAL

FOR RUGGED AND RELIABLE PERFORMANCE IN MILITARY APPLICATIONS, TRUST THE ONLY PTP SYSTEM THAT HAS EARNED INCLUSION ON THE UNIFIED CAPABILITIES APPROVED PRODUCTS LIST: THE PTP 600 FROM CAMBIUM NETWORKS.



ON THE MOONSCAPE OF A DEEP DESERT WEAPONS AND ORDINANCE TEST RANGE, engineers set up temporary long-range point-to-point (PTP) wireless broadband links. The system reliably and securely transports crucial testing data over more than 30 miles of challenging terrain from the detonation site to the command and control center.

AT AN EXPANDING MILITARY POST, construction of numerous new buildings demands efficient new building-to-building connectivity. Due to the high cost and long lead times of connecting geographically diverse buildings with fiber or copper systems, the base communications department decides to go wireless. The new PTP wireless systems combine cost-effective connectivity with high throughput and take days to set up, as opposed to months or longer for fiber networks.

AT A LARGE BASE, communications professionals are faced with the task of delivering high throughput for crucial telemetry from sensors along a 250-mile path that includes challenging terrain such as rivers and hills. To meet these challenges, the communications team installs a multi-hop PTP wireless broadband network with links ranging from 50 to 75 miles each. The system consistently delivers exceptionally high data rates efficiently and cost-effectively, even under near- and non-line-of-sight conditions.

More than a decade ago, the Army initiated its Installation Information Infrastructure Modernization Program (I3MP). Since then, military base commanders and personnel have been working within the program to enhance base operations in numerous areas, one of the most important of which is communications.

In today's Army, communications are as challenging as they are crucial, and the challenges are many. Collecting and transporting perimeter sensor data. Capturing and backhauling ordnance and weapons test telemetry. Directing, monitoring and analyzing Warfighter games and training exercises. Providing high-speed, cost-efficient building-to-building and site-to-site connectivity. To meet these and many other challenges, base CIOs and their staff need a new breed of communications solutions.

KEEPING PACE WITH CHANGE

Over the last few years, the pace of change in communications technology has increased dramatically, driven by commercial-sector breakthroughs that provide significant increases in performance, ease of use, security, cost-efficiency and more. As military CIOs look to strengthen and streamline base and test range communications as part of I3MP, they're looking for solutions that combine commercial-grade breakthroughs in performance with military-grade reliability and ruggedness.

On defense facilities around the country and the world, military communications professionals are discovering that one of today's most reliable, versatile and cost-efficient communications solutions is the point-to-point wireless broadband network. They're also discovering a new force in delivering the rugged, high-capacity PTP performance military applications demand. They're discovering a new company with a long history of wireless communications partnership with the military on the base and on the battlefield.

The company is Cambium Networks.

The product is the **Cambium PTP 600**, the only PTP product on the UC-APL.



PTP AND I3MP

Our PTP 600 solutions are poised to play a vital role in the Army's I3MP program. They deliver the high performance and high reliability that helps military installations in the U.S. and around the globe replace legacy communications systems with new high-speed networks that enable the multimedia convergence of voice, video and data traffic. Furthermore, they do everything quickly, easily, reliably and cost-effectively.

As base commanders and CIOs examine I3MP communications solutions, they are concerned with communications challenges in a variety of applications, both on the post itself and on the test range.

ON-POST APPLICATIONS. A growing number of bases are utilizing PTP 600 solutions for simple, reliable and cost-efficient building-to-building and site-to-site connectivity. They can install PTP 600 systems faster and more inexpensively than fiber or copper, which entails costly trenching and having to wait weeks or months for project completion. With the PTP 600, installation is simple and fast, often accomplished in a day or two. Many bases are also using the PTP system as a more affordable alternative to paying recurring costs for E1/T1 lines, or as a cost-effective redundant path for continuity of communications in the event the primary line fails.

In addition, PTP 600 systems are enhancing interior and perimeter post security, connecting perimeter sensors and video surveillance cameras with security stations. PTP 600 equipment transmits telemetry and multimedia data at high data rates, even at long distances and over difficult terrain studded with formidable RF path obstructions.

TEST-RANGE APPLICATIONS. PTP 600 equipment is currently being used by many base communications departments for long-range transportation of voice, video, telemetry and other data from test ranges or zones back to a control center. Fundamentally, base command is extending a communications umbrella, or cell, over the test range where a variety of activities — ranging from testing arsenal and ordnance to conducting large-scale troop training and Warfighter games — are conducted. By placing PTP 600 equipment on various towers around the ranges, the communications team is able to create permanent or temporary connectivity to capture the telemetry and data from these tests and then securely transport it back at a high data rate to a central point for monitoring and analysis.

Support for training and maneuvers includes sending high-definition video back to the control center in real time, enabling command to monitor and control troop placement and movement every minute of the exercise. With its ability to provide connectivity and performance even under difficult RF conditions, the PTP 600 is proving itself as a highly reliable solution for test ranges that have serious path obstructions such as dense foliage, hills, rivers, lakes or other bodies of water.

The PTP 600 also ensures bases of streamlined connectivity with the official Army Joint Network Node, and to the eventual Warfighter Information Network – Tactical (WIN-T).

ONGOING PTP 600 USE CASES

The PTP 600 is earning the confidence of base CIOs in their implementation of I3MP in part by proving its versatility through exceptional performance in a wide range of applications on Army posts around the world.

TEST RANGE CONNECTIVITY. The PTP 600 is currently in use at a number of installations for multi-purpose connectivity in various zones on test ranges on the bases. Military communications personnel set up permanent PTP 600 hot spots in highly used areas of the range, providing communications coverage for war games, maneuvers and training. PTP 600 equipment provides broadband connectivity among multiple groups of soldiers on the range, as well as connectivity back to a control center enabling commanders overseeing the exercises to exchange multimedia information, including voice and video, with troops in the field, simulating in-theater operations.

MULTI-HOP CONNECTIVITY. At one large installation, the PTP 600 is providing connectivity to adjacent posts — some of which are 250 miles apart with links of 50 to 75 miles in length — at much less cost than traditional microwave. The base uses the network for backhauling RF sensor data to a control post at high data rates. The PTP 600 solution cost-effectively delivers approximately 200 Mbps of throughput across this multi-hop path with exceptional cost-effectiveness. PTP 600 radios are also being used for tactically deployed high capacity PTP links that connect the control center with various test range clients, which are often DoD-funded programs.

THE CAMBIUM PTP PORTFOLIO

The PTP 600 is part of Cambium Networks' complete portfolio of versatile PTP wireless Ethernet bridges. Proven over more than 2.2 billion field hours, our PTP solutions provide reliable high-speed connectivity in licensed and unlicensed frequency bands. In addition to a full range of unlicensed products, we offer the PTP 800 Series for licensed frequencies. The PTP 800 is IP-optimized and provides the bandwidth, scalability and affordability needed for today's fast-evolving communications networks.

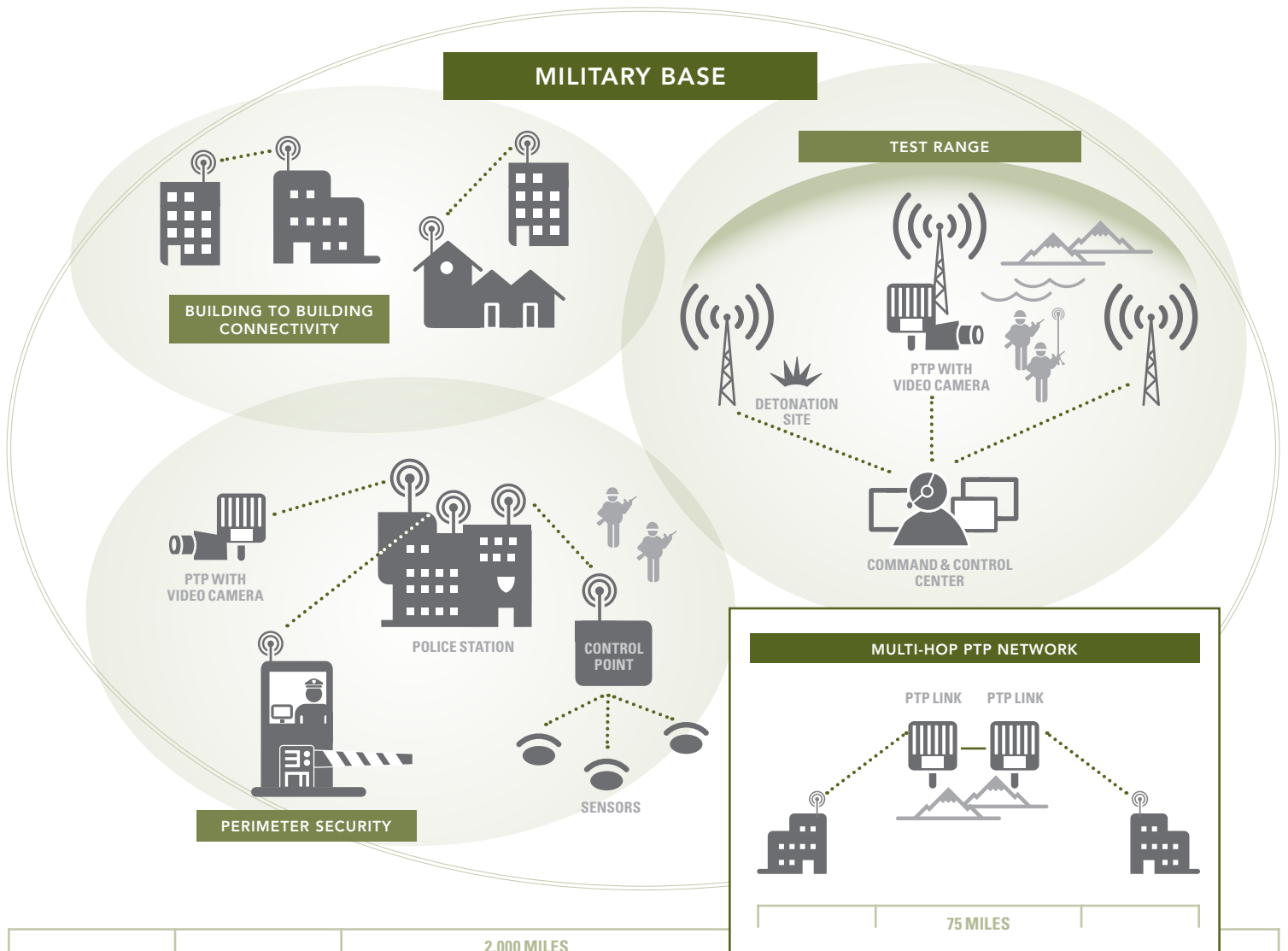
LONG-DISTANCE CONNECTIVITY. At a large military proving ground, PTP 600 links support ordnance testing by streaming high-definition video to a control facility 15 miles away, allowing for real-time monitoring of test video and data. At this installation, network usage is usually assignment-based, so the team normally does not set up permanent links; instead it deploys temporary networks designed specifically for each test. The communications team selected PTP 600 equipment for its quick, simple setup and its ability to transport information at high data rates over lengthy RF paths that include all manner of path obstructions.

OVER-WATER CONNECTIVITY. The PTP 600's ability to transmit reliably over water led to its ongoing usage on a coastal bombing test range covering thousands of square miles of land and ocean. The PTP 600 system

provides high-capacity links between the mainland and an island 75 miles offshore. Military communications personnel selected the PTP 600 equipment in large part because of its ability to reliably deliver high data rates over a challenging 80-mile-long over-water link.

VERSATILE, FLEXIBLE CONNECTIVITY.

At a military base where on-going experiments are conducted on a floating barge, PTP 600 versatility is helping base command deal with a difficult communication challenge. The deployment is unusual not only in that it involves sending signals over water, but also in that one end of the link is on a moving platform on the water. Moreover, it's an extremely long path, making the task even more challenging. With its PTP 600 deployment, the communications team is providing reliable, high-throughput connectivity between the base and the floating laboratory.



PTP ON THE APL

The Cambium PTP 600 is the first and only PTP product that appears on the Army UC-APL. To merit inclusion on the list, the PTP 600 underwent rigorous testing at the Army Technology Integration Center (TIC). During testing, the PTP 600 underwent numerous STIGs — sets of rigorous guidelines — for both Information Assurance (IA) and Interoperability (IO). In passing the IA STIGs for security, the PTP 600 met auditing, system logging, account and password management, access control and other security-driven requirements. In passing the Interoperability (IO) STIGs, the product proved compliant with strenuous performance, latency, throughput and other guidelines. The PTP 600 passed all tests with flying colors and is now the first and only PTP solution — and one of the few wireless products under the Fixed Network Elements (F-NE) category — on the UC-APL. The product is also compliant with all procurement requirements.

In addition to APL tests at the TIC, the PTP 600 has also undergone strenuous physical security testing as part of the FIPS 140-2 certification process. PTP 600 products have also been tested to military specifications for ruggedness and physical security under extreme weather and terrain conditions.



THE PTP 600 DIFFERENCE

Why is the Cambium PTP 600 an excellent solution for I3MP implementation? Aside from being on the APL, there are a great many additional reasons. The fact is, PTP 600 equipment offers base CIOs and communications teams some of the most versatile and cost-effective wireless communications solutions available. From E1/T1 replacement to long distance backhaul to temporary links for maneuvers and war games to building-to-building connectivity and more, the PTP 600 provides high-speed communications of up to 300 Mbps under the most difficult conditions and in the most challenging RF environments. The PTP 600 is U.S. Army spectrum-approved, operating in licensed and unlicensed frequency bands. The system is uniquely spectrally efficient, providing clear signals even in environments with many radios competing for spectrum. Equally important, the PTP 600 is FIPS 140-2 certified and ruggedized for 99.999% availability.

Based on breakthrough Orthogonal Frequency Division Multiplexing (OFDM) technology, the PTP 600 delivers exceptional near-line-of-sight (nLOS) and non-line-of-sight (NLOS) coverage in locations where foliage, tall buildings, hills or other obstructions limit wireless broadband access. It also delivers exceptional performance at the most extreme temperatures and under the most difficult weather conditions. Importantly, PTP 600 solutions provide Layer 3 Quality of Service (QoS) to enhance prioritization of voice traffic. And they deliver the speeds necessary to support today's increasingly bandwidth-intensive solutions, including high-speed data access, streaming video and VoIP.

PROVEN PTP DURABILITY

The PTP 600 and other Cambium PTP wireless Ethernet bridges are industry leaders in ruggedness and durability. Through years of service in difficult environments around the world and through rigorous testing, including FIPS-140-2, our PTP products are proven to deliver outstanding durability metrics. For the PTP 600, these include a Mean Time Before Failure (MTBF) of 441 years; an operating temperature range from -40° to $+140^{\circ}$ F (-40° to $+60^{\circ}$ C); and wind speed survival of 202 mph (325 kph).

CAMBIUM AND THE MILITARY



Although Cambium is a new company, the military knows us from our long history as an integral part of Motorola's pioneering and innovative wireless communications solutions. And from our reputation in the area of mission-critical networks serving public safety operations and other local, regional and federal government agencies. Now an independent company, Cambium Networks currently has wireless equipment and solutions deployed in thousands of networks in over 150 countries. Our solutions provide reliable, secure, cost-effective connectivity that's easy to deploy and proven to deliver outstanding metrics.

Along with our industry leading technology expertise, our new independence brings a new intensity, a new energy and a new focus on helping military IT professionals accomplish their communications missions with powerful, cost-effective wireless broadband ideas and solutions. At Cambium, our mission is to be a resilient, flexible resource for helping you solve your communications issues both on- and off-garrison, and increasing efficiency, security, productivity and above all, safety.

CAMBIUM PTP SUCCESS

Cambium PTP networks are already hard at work safeguarding our forces around the globe. Our PTP solutions continue to prove themselves day-in, day-out in a wide variety of mission-critical military applications both on-base and in-theater. Our situation awareness systems — such as BETSS-C, C-RAM, PSDS2, G-BOSS and more — helped our forces succeed in Iraq and are currently supporting and protecting our soldiers and our mission in Afghanistan.

The numerous successes PTP 600 solutions are having in these on-post and in-theater use cases are indicative of the equipment's combination of power, simplicity and cost-effectiveness. Even though the PTP 600 is a simple point-to-point, one-radio-to-one-radio system, the uses for which it is deployed are extremely diverse. PTP 600 equipment works in so many different environments and applications, and is so easy to use and so tolerant of challenging conditions that, now that it is APL-listed, a growing number of military CIOs are taking notice of the many different ways the system can help them in their I3MP initiatives of today and tomorrow.

RAPIDLY DEPLOYABLE PTP WIRELESS BROADBAND

The Cambium RDB 350 is an off-the-shelf 802.16e WiMAX technology solution ruggedized for military applications with one-hour setup and tear-down. Compliant with MIL-STD-810G, the RDB 350 is ideal for permanent base and garrison environments, with multiple fixed wireless access points (AP) and remote modules (RM), including vehicle-mounted RMs. It is also designed for tactical and temporary installations with APs mounted on temporary masts and RMs on fixed or vehicle-mounted masts. The RDB also provides exceptional convoy mobility, with APs and RMs mounted on vehicles to provide communications, such as live video feeds, to every vehicle in the convoy.

ABOUT CAMBIUM NETWORKS

Cambium Networks, formerly part of Motorola Solutions, provides world-class wireless broadband and microwave solutions for military, government, municipal and enterprise customers around the world. It currently has more than 3.2 million products deployed in thousands of networks in over 150 countries, with its innovative technologies providing reliable, secure, cost-effective connectivity that's easy to deploy and proven to deliver outstanding metrics. Cambium's ecosystem of partners, development engineers, and support teams work together to design and deliver innovative, forward-looking solutions that provide data, voice and video connectivity when and where it's needed.

To learn more about how the Cambium PTP 600 can help you implement successful new I3MP initiatives, contact your Cambium representative, or visit us on the Web at www.cambiumnetworks.com.